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W. GILPIN
EC 15004

Sunshine

**STEAM
AND
HOT WATER
HEATERS**

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HEATERS

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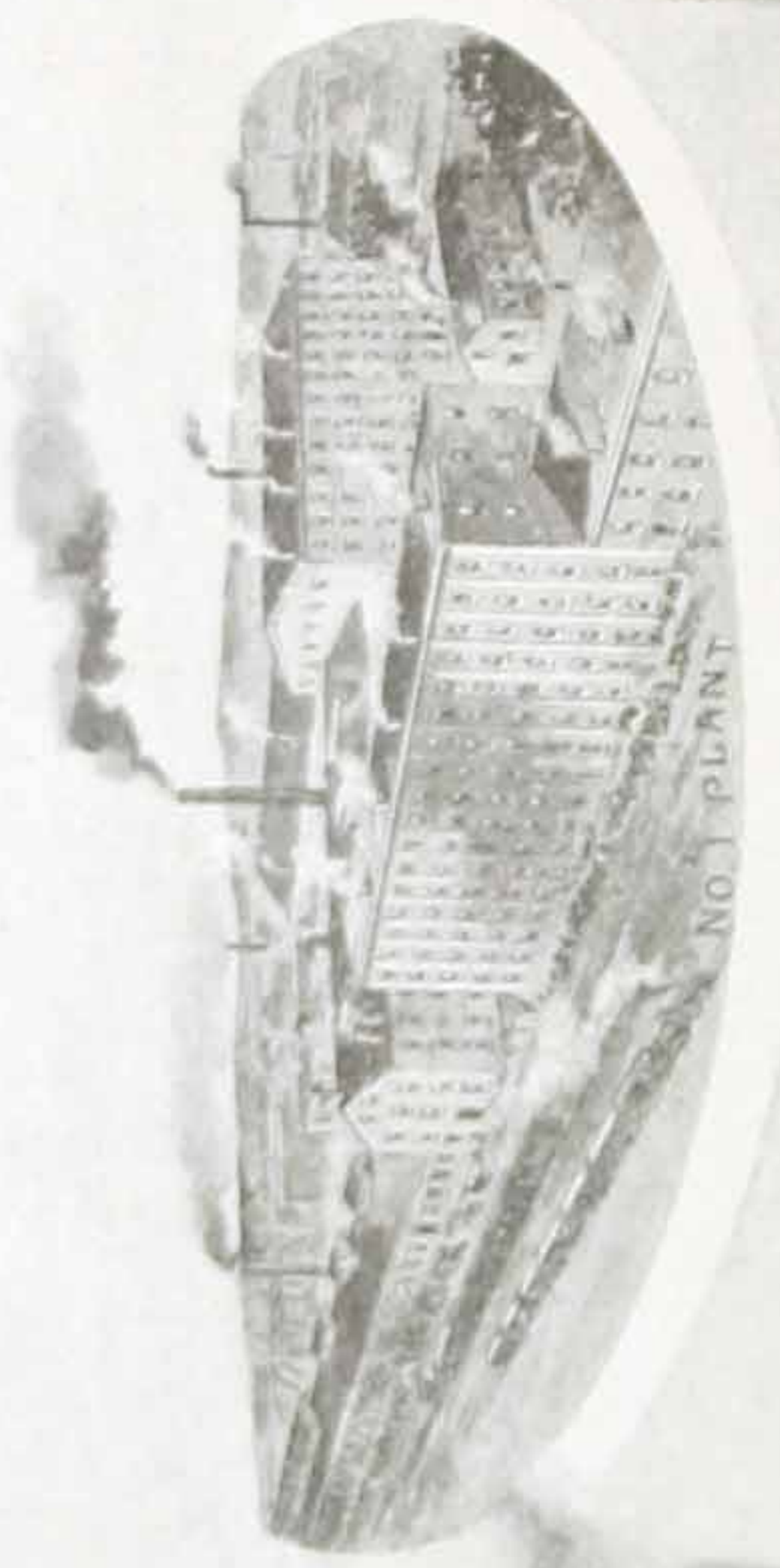
REFERENCE. PAMPHLET.

Gresham
STOVES, RANGES, AND FURNACES.

STEAM AND WATER PUMPS



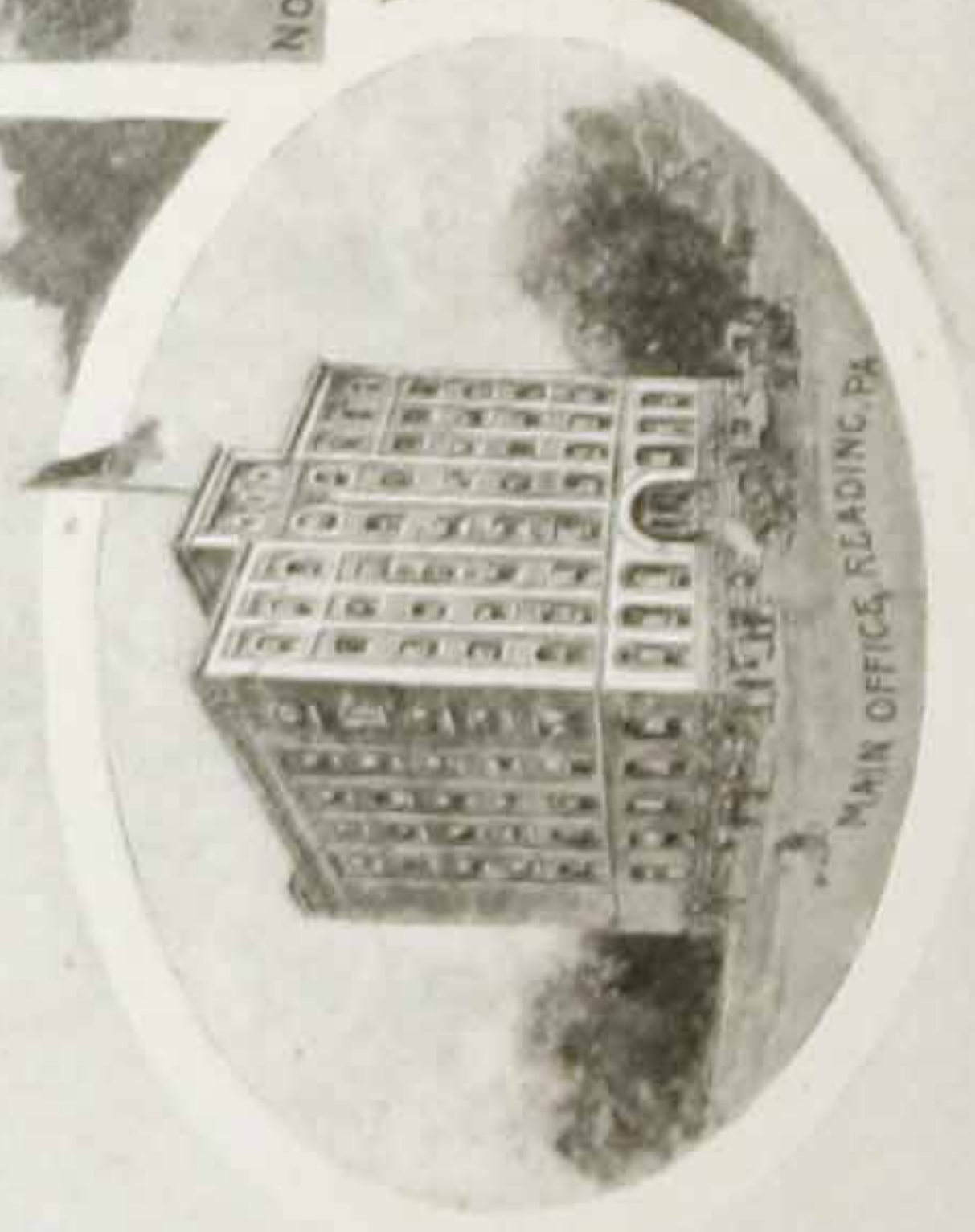
PHILADELPHIA BRANCH



NO. 1 PLANT

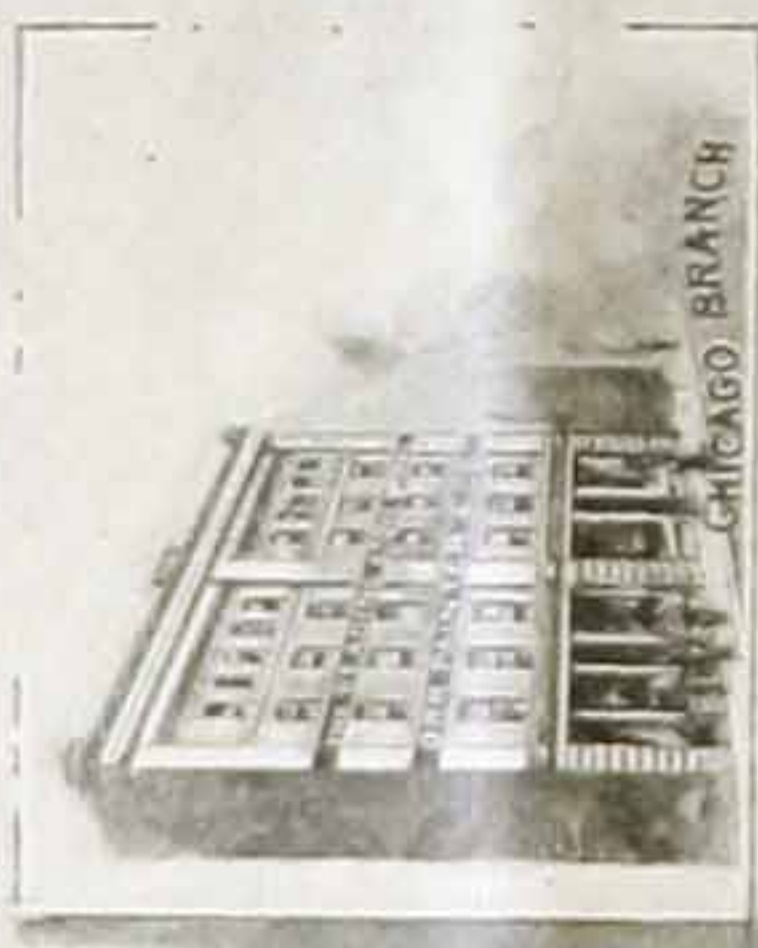


NO. 2 PLANT



MAIN OFFICE, READING, PA.

Philadelphia
Chicago
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THE READING STOVE WORKS
ORR, PAINTER & CO.

MAIN OFFICE & FACTORIES
READING, PA., U.S.A.

HOT WATER AND STEAM
CATALOGUE No. 3.

MONARCH, IMPERIAL,
AND VESTAL,
SUNSHINE HEATERS

MANUFACTURED BY

THE READING STOVE WORKS,
ORR, PAINTER & CO.

READING, PA., U. S. A.

W. HARRY ORR, PRESIDENT
EDGAR AMOLE, TREASURER

WM. S. ESSICK, SEC'Y AND GEN. MGR.
CHAS. H. WILLIAMSON, SUPT.

F. L. CONNARD,
MANAGER HEATING DEPARTMENT

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We sell our
heaters to
the heating trade
only. We do not
install plants our-
selves, and are in
no way connected
with or interested
in any contract-
ing firm.





Cast-iron Heaters. The cast-iron house heating boiler has grown to be the most popular through its ease of management, economy, facility for repair, rapidity of installation, ease of handling and efficiency.

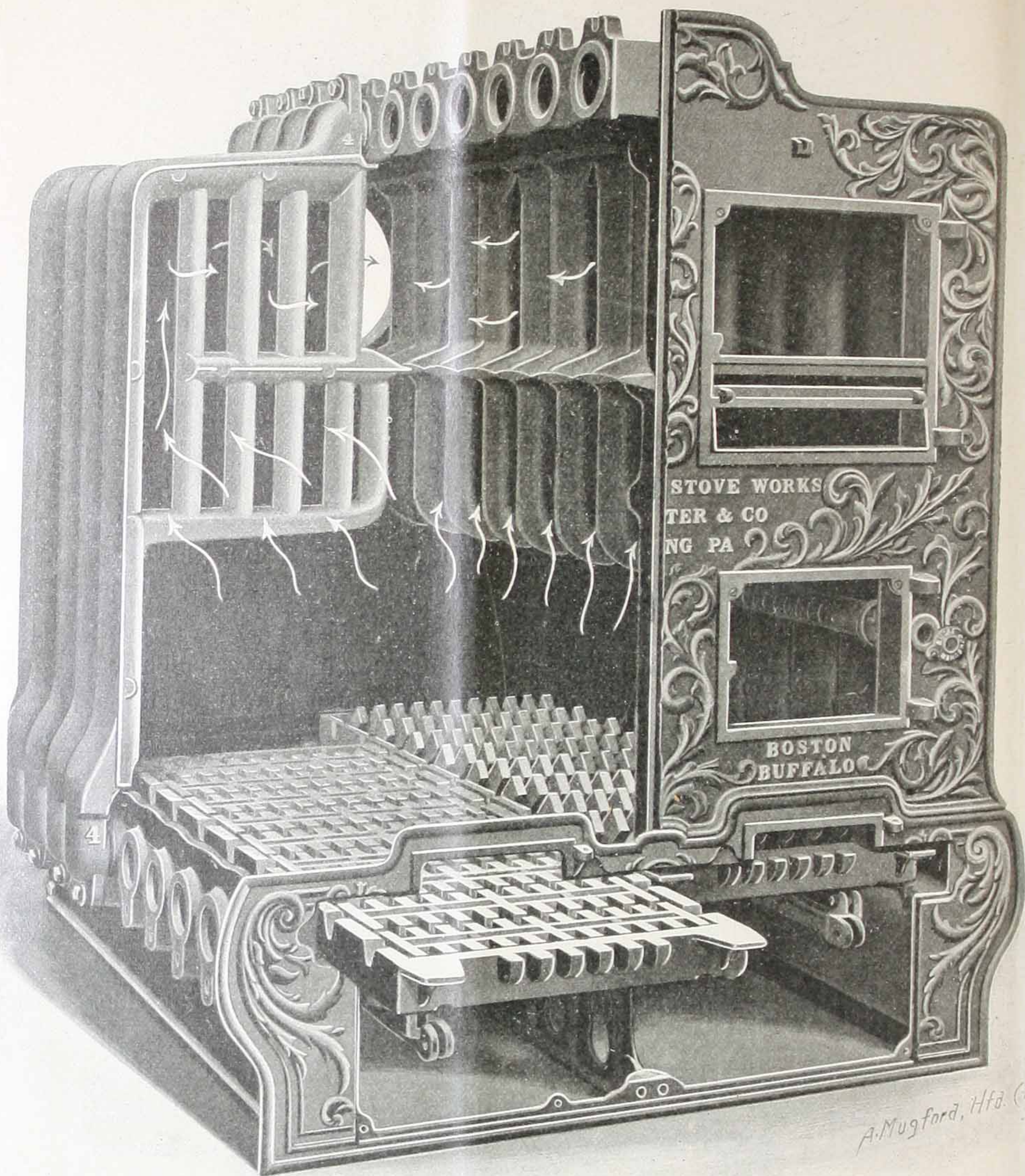
Equipment. Our foundries are favorably located and well equipped to handle all classes of work, having a reputation extending over thirty years in the manufacture of high-grade Stoves, Ranges and Furnaces. In the last three years we have added Hot Water and Steam Heaters to our extensive line and we are now in a position to supply our customers with anything they require.

Capacities. With the addition of our two series of Monarch Sunshine Heaters we can furnish all sizes from the smallest round boiler carrying 175 feet of steam, to the largest double grate Monarch Sunshine carrying 5200 feet of hot water.

Interchangeable Parts. All parts are made interchangeable, making our heaters easy to set up and easy to repair. All reamed holes are made over hardened templates compelling them to be exactly the same for all heaters. Heaters are all shipped in sections or dismantled so as to be easily handled and carried through any ordinary door.

Workmanship. All parts are fitted by skilled mechanics and thoroughly inspected, each heater being set up before leaving the works, so that imperfect goods are not sent out.

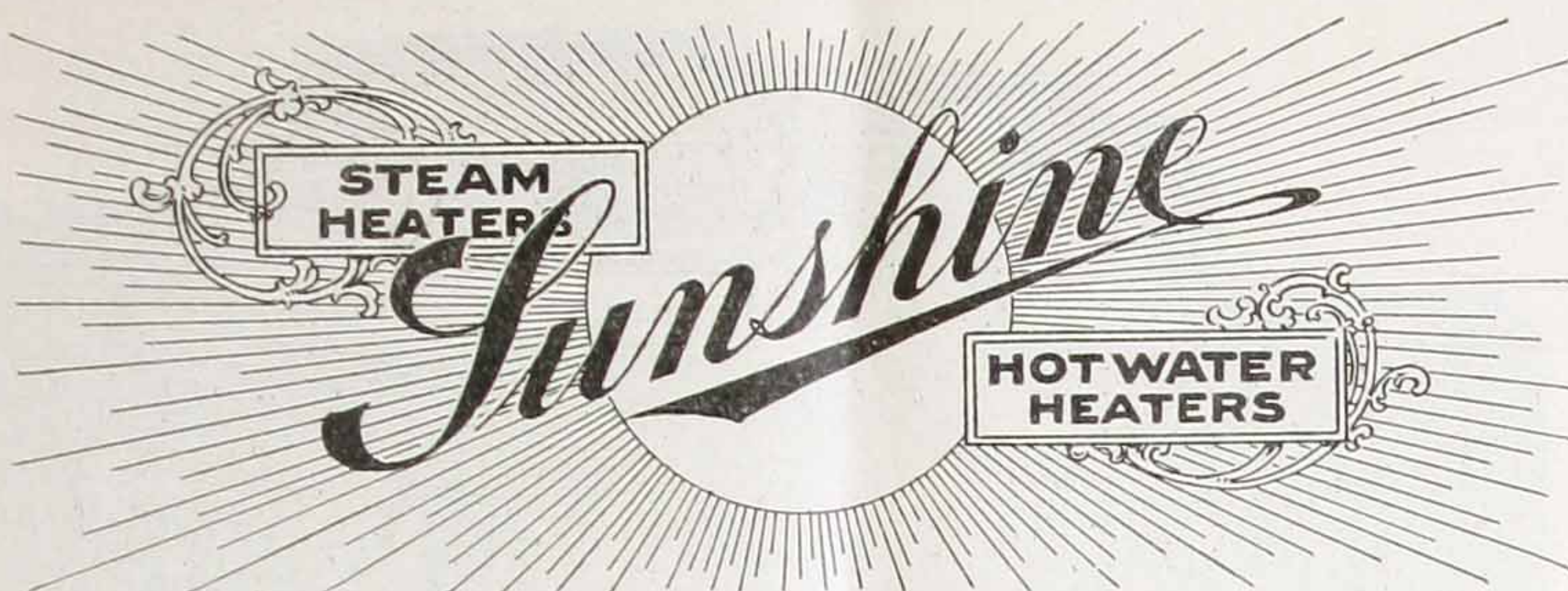
1090-3432 TCF



MONARCH SUNSHINE HEATER. 41 SERIES. WATER.

Showing draft, arrangement of sections, operation and removal of grate.

For sizes, etc., see pages 38-39.



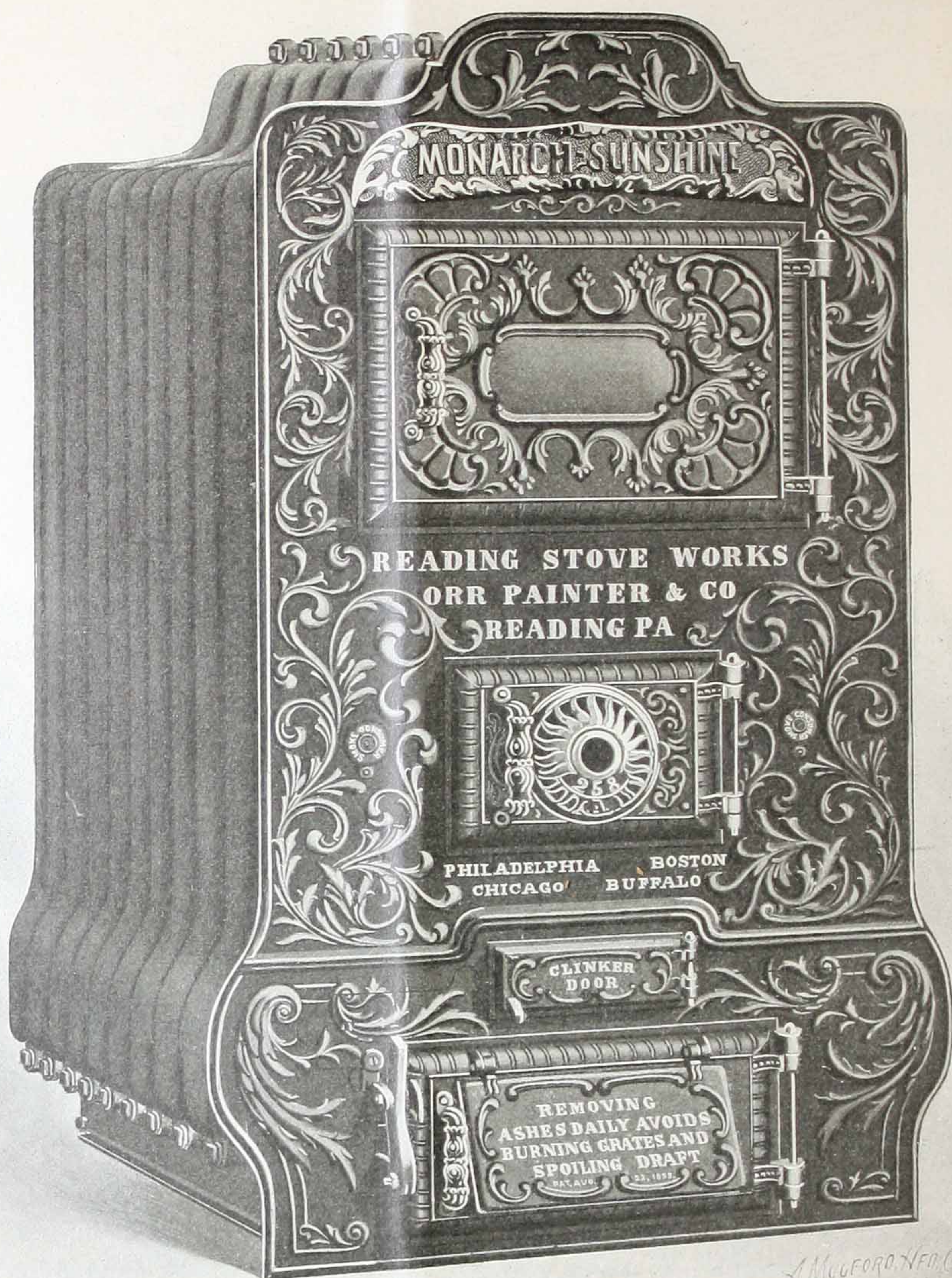
Guarantee. We guarantee that all our heaters are conservatively rated in accordance with accepted standards, and when proper care has been exercised in the installation of the heating plant, with due regard to proper flue, they will give entire satisfaction. All sections and cored castings are carefully tested to a pressure of 80 lbs. and all castings are guaranteed to the extent of furnishing new castings for any found to be defective in manufacture.

Ratings. The ratings are based upon an indicated pressure of 2 lbs. at the boiler for steam and a temperature of 180° as it leaves the boiler for water. Ratings also provide that in estimating size of boiler required all piping (mains and risers, flow and return) shall be figured as radiating surface in addition to the cast-iron direct radiation to be used.

When indirect radiation is used count each foot as equal to a foot and a half of direct or figure 50% increase over direct radiation in determining the size of boiler required.

Connections. All joints or connections of sections and waterways are made with a Wrought-iron Slip or Push Nipple which has proved to be the *best* and now adopted by all modern manufacturers. It is easy to make a tight joint, easy to take apart, most durable and reasonable in cost.

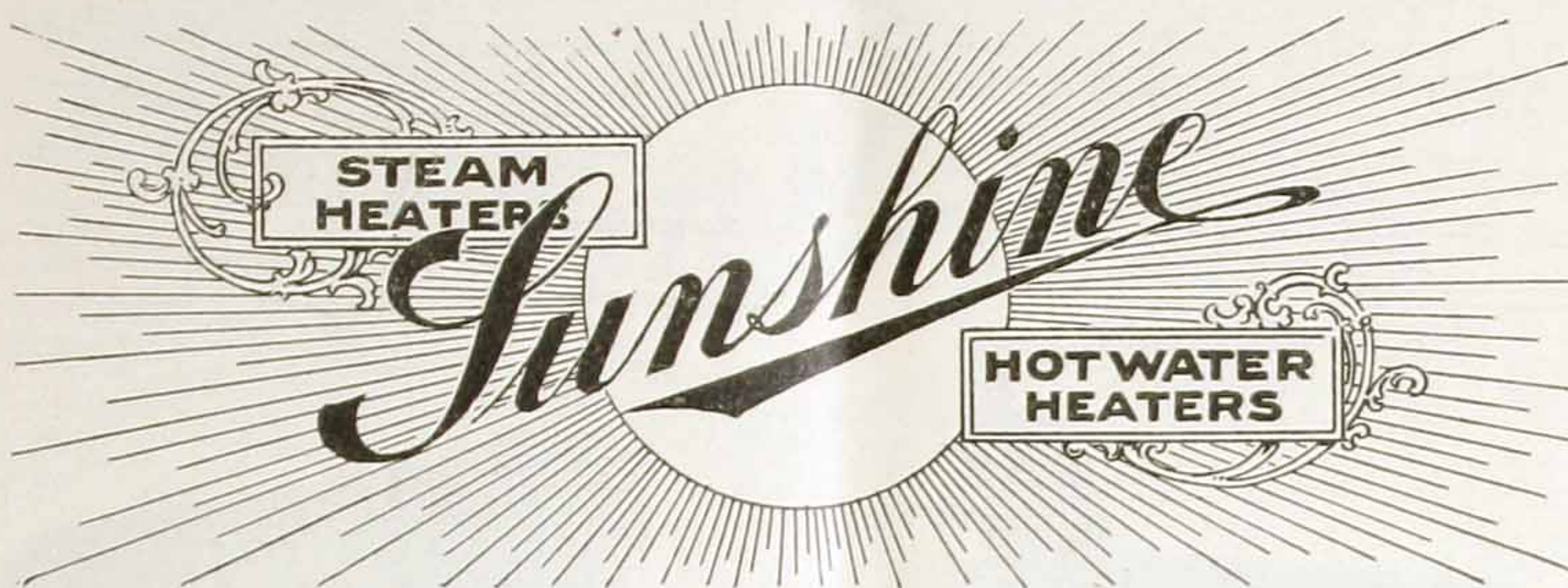
The nipples are made of extra heavy wrought-iron tubing, accurately turned in a lathe to fit the reamed holes. All joints are drawn together by wrought-iron bolts which pass through specially



A. McFORD, N. H. C.

MONARCH SUNSHINE HEATER. 25 SERIES. WATER.

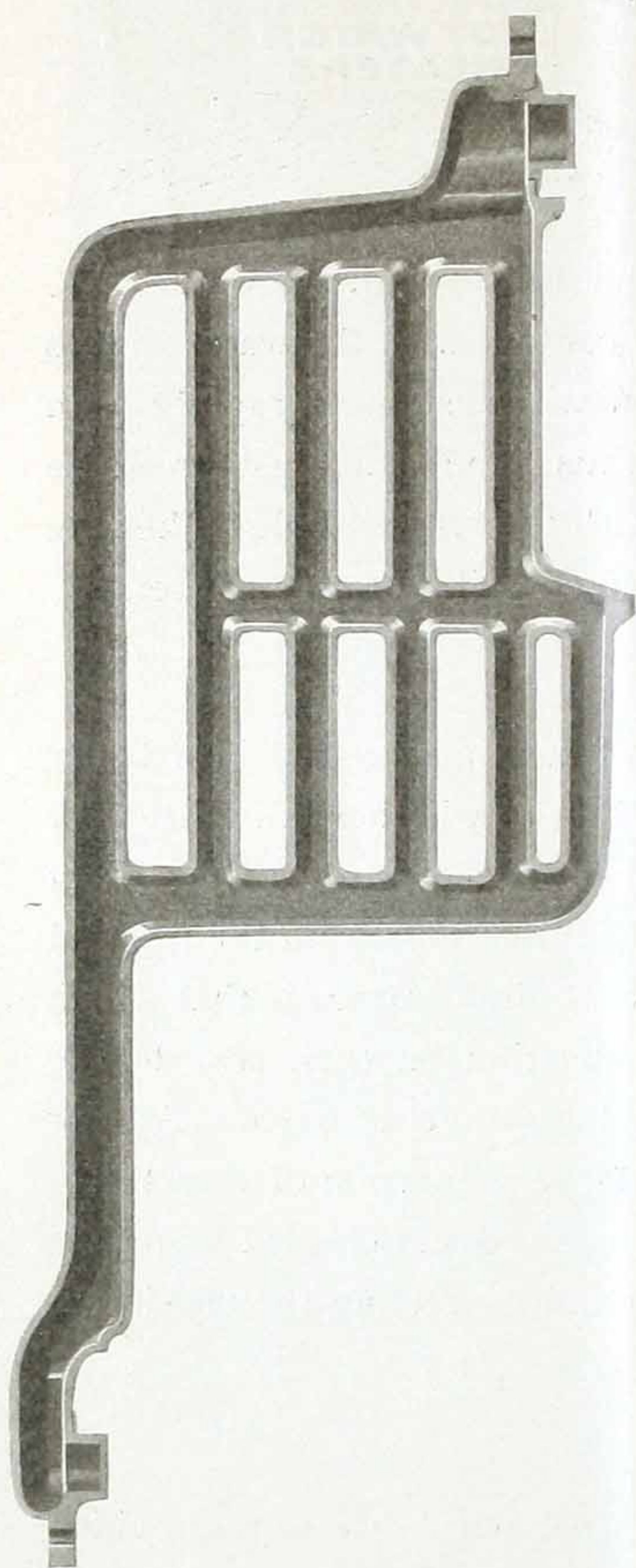
Also made for Steam. For sizes, etc., see pages 40-41.



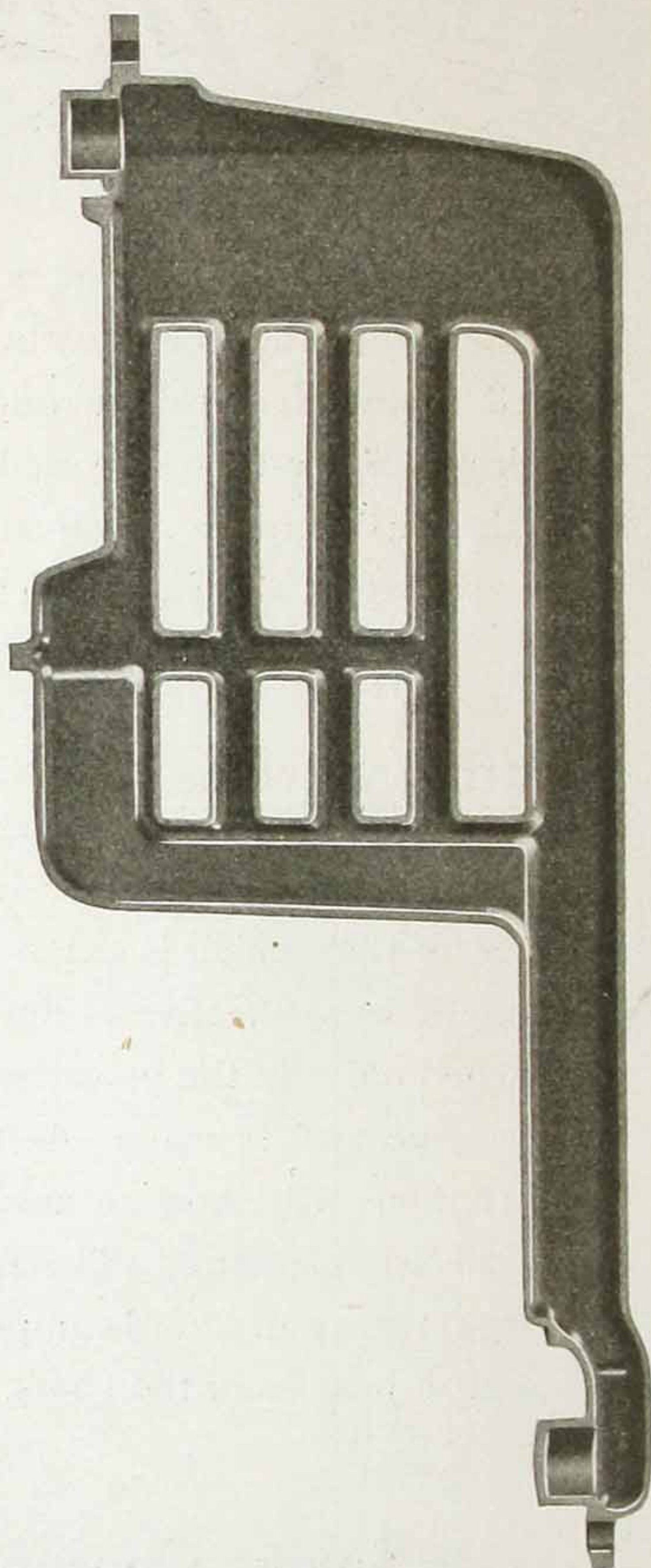
cored holes or outside of the heater and not through the waterways. This prevents the bolts rusting from contact with the water as it is a well known fact that wrought-iron will rust more rapidly than cast-iron. All vital connections are thus insured against breakage and the push nipple in connection with the reamed hole makes the most accurately aligned and self contained boiler on the market.

Heating Surface. The value of heating surface in a boiler varies according to whether it is direct or flue surface and the manner in which the heat strikes it. Direct surface is that which is exposed to the direct rays from the fire and is three times as effective as flue surface. Flue surface is that which is reached only by the products of combustion on their way to the smoke pipe and is made effective by long travel of gases. All our constructions will show an unusually large proportion of direct surface, all self cleaning. The flue surface is easily cleaned by means of large doors and affords ample travel for extracting the maximum amount of heat from the gases.

Gas or Smoke Consumers. All our heaters are provided with patented gas or smoke consumer pipes. In the combustion of coal it is almost impossible to get the proper amount of air through the grate to consume all the gases from the coal. These gases contain a large amount of carbon which would not produce heat and would be wasted through the chimney. By using air conduits which admit the proper amount of oxygen to the surface of the fire we have succeeded in consuming



$\frac{1}{2}$ Monarch Middle Section.
4I Series. Water.
(Open view showing waterways and flues.)



$\frac{1}{2}$ Monarch Middle Section.
4I Series. Steam.
(Open view showing large waterways and
steam space at top.)

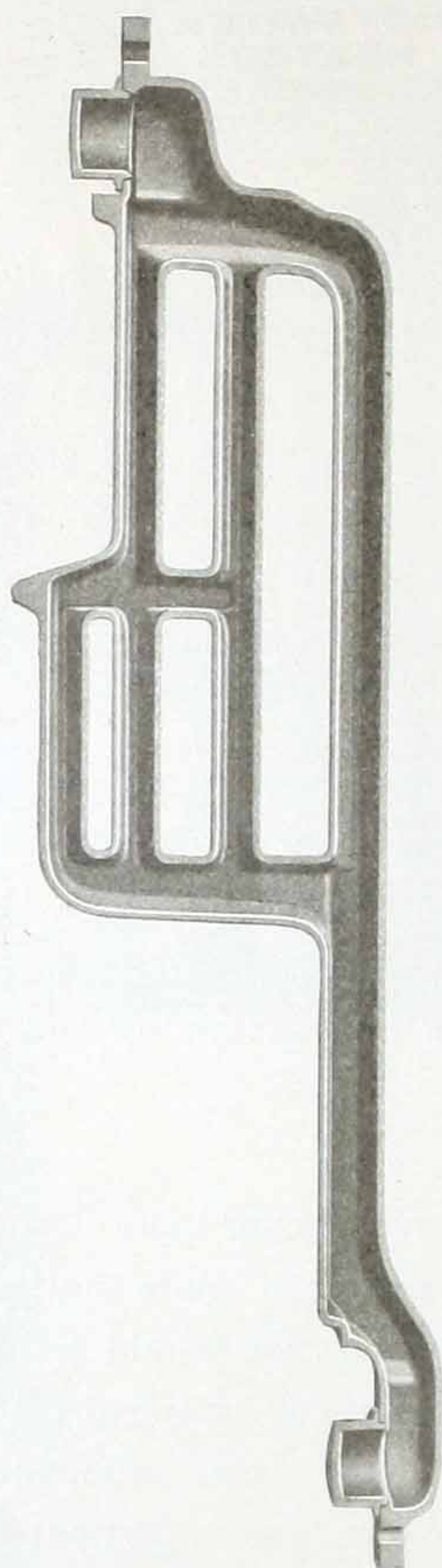


these waste gases and producing a saving of from 15 to 20% in fuel.

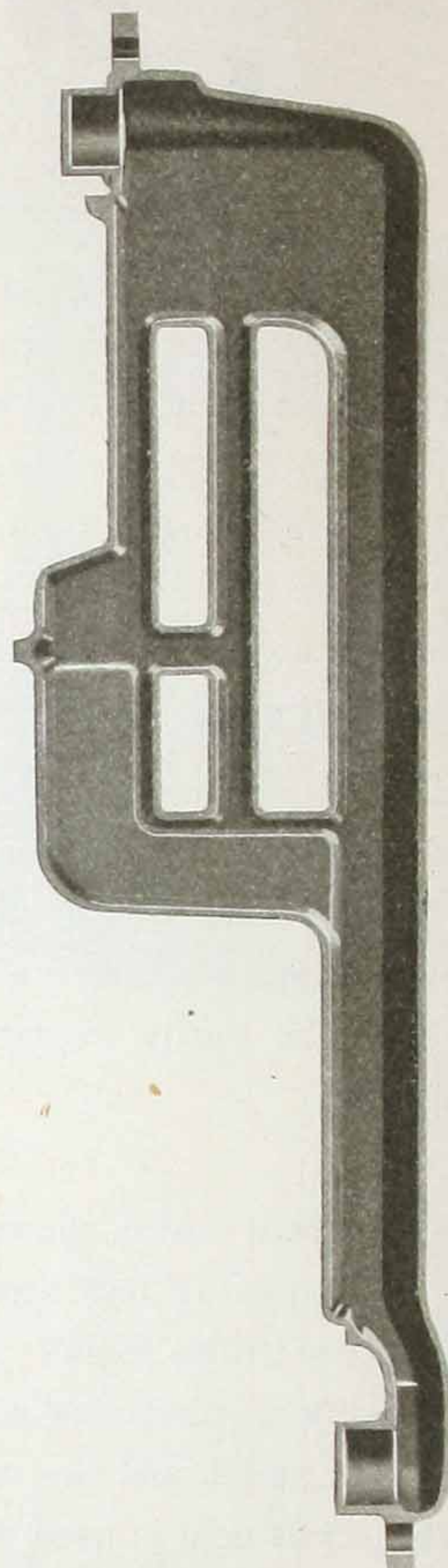
The gas consumers are pipes placed near the surface of the fire at its proper height. They should *never be covered* with coal. Openings in the front of heater admit air to these tubes and should *never be closed* except to check fire in warm weather. The air enters these openings, passes through the highly heated tubes and discharges at a high temperature through small openings over the surface of the fire.

This attachment has proved a great economizer in our air furnaces, water and steam heaters. It is particularly useful in the case of soft coal which has a larger proportion of these gases and requires a larger proportion of air. The tubes are so arranged that they can be easily replaced if broken or burned out by lack of attention.

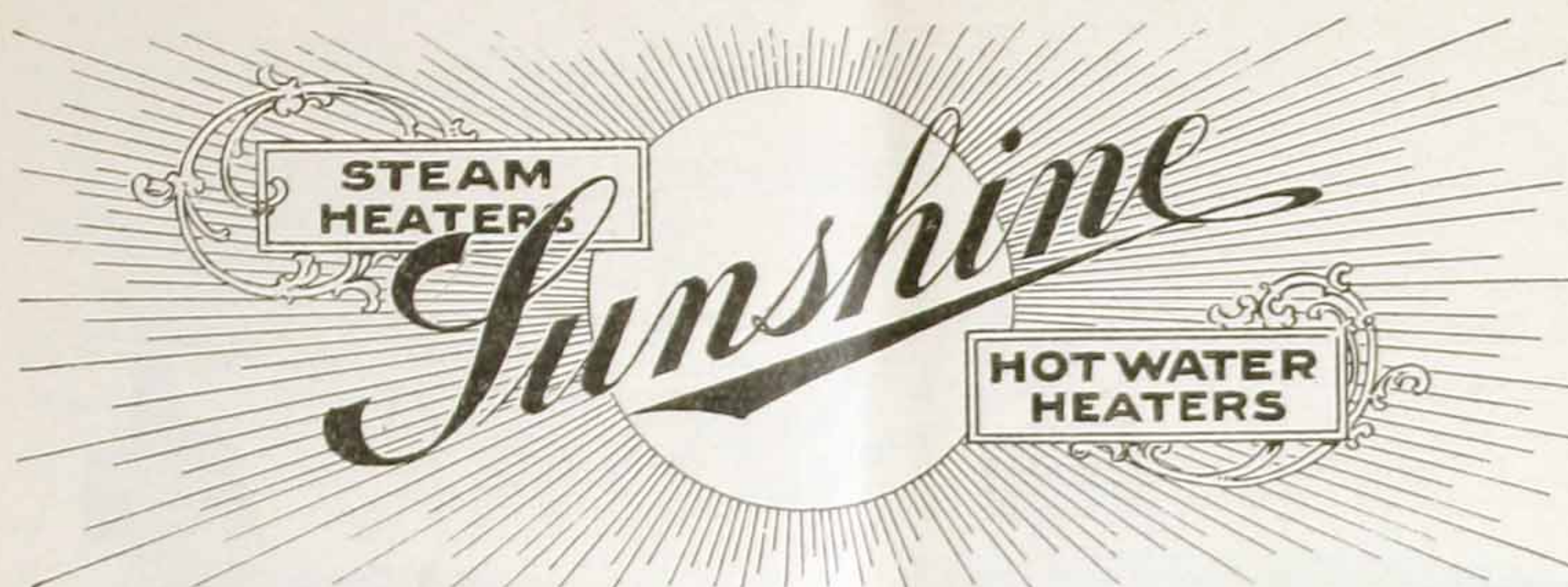
Fuel. Hard coal is the most satisfactory fuel, being more cleanly, requiring less attention and producing a more uniform temperature in the rooms. In the larger heaters we would recommend using a good size coal, but the grates are so arranged that a medium or small coal can readily be used and give very economical results. Soft coal is used with very satisfactory results, particularly on account of our smoke consuming device. It is advisable, however, to use a coal which will not bake on the surface and does not contain too much tar. In all cases for soft coal we recommend *a size larger* heater than would be required for hard coal. Well seasoned hard wood or crushed coke are both cheap and economical fuels in some localities, but require frequent attention and careful cleaning of the heater to obtain good results.



$\frac{1}{2}$ Monarch Middle Section.
25 Series. Water.
(Open view showing waterways
and flues.)



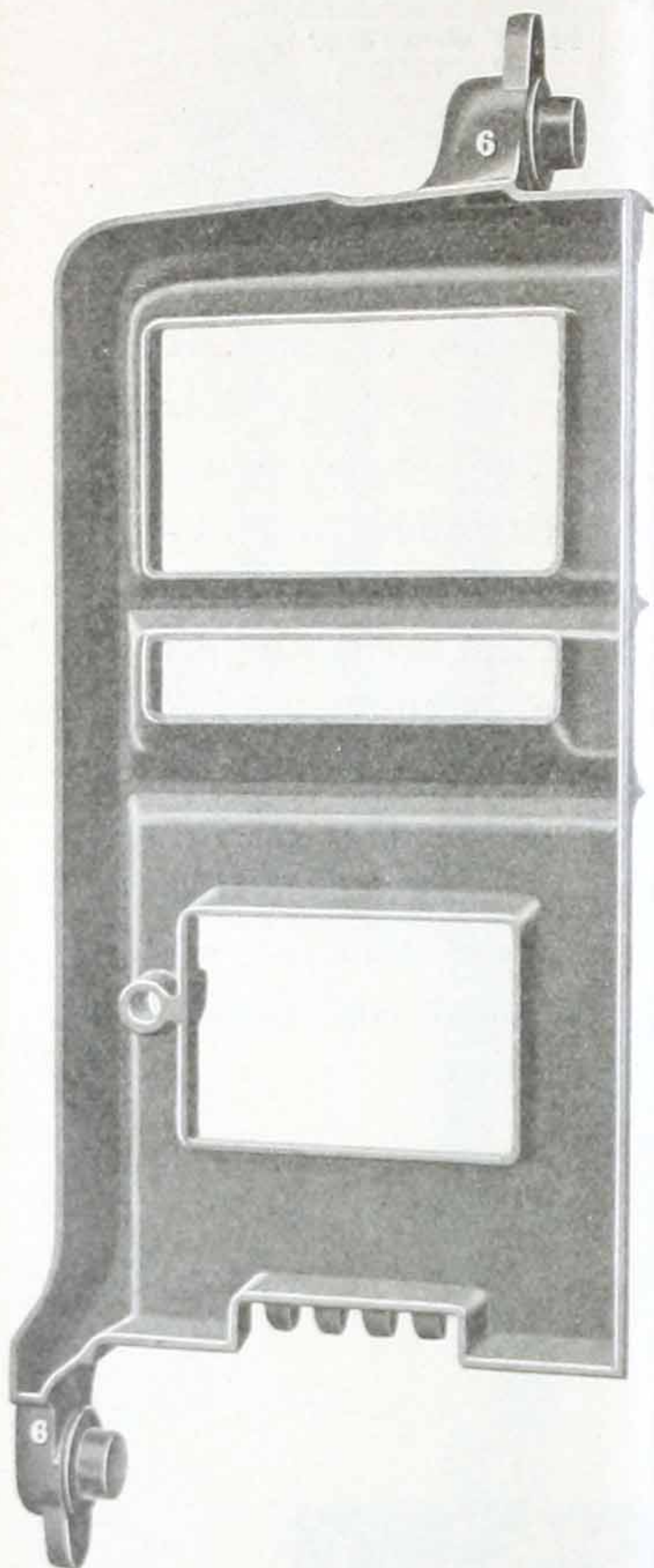
$\frac{1}{2}$ Monarch Middle Section.
25 Series. Steam.
(Open view showing large waterway
and steam space at top.)



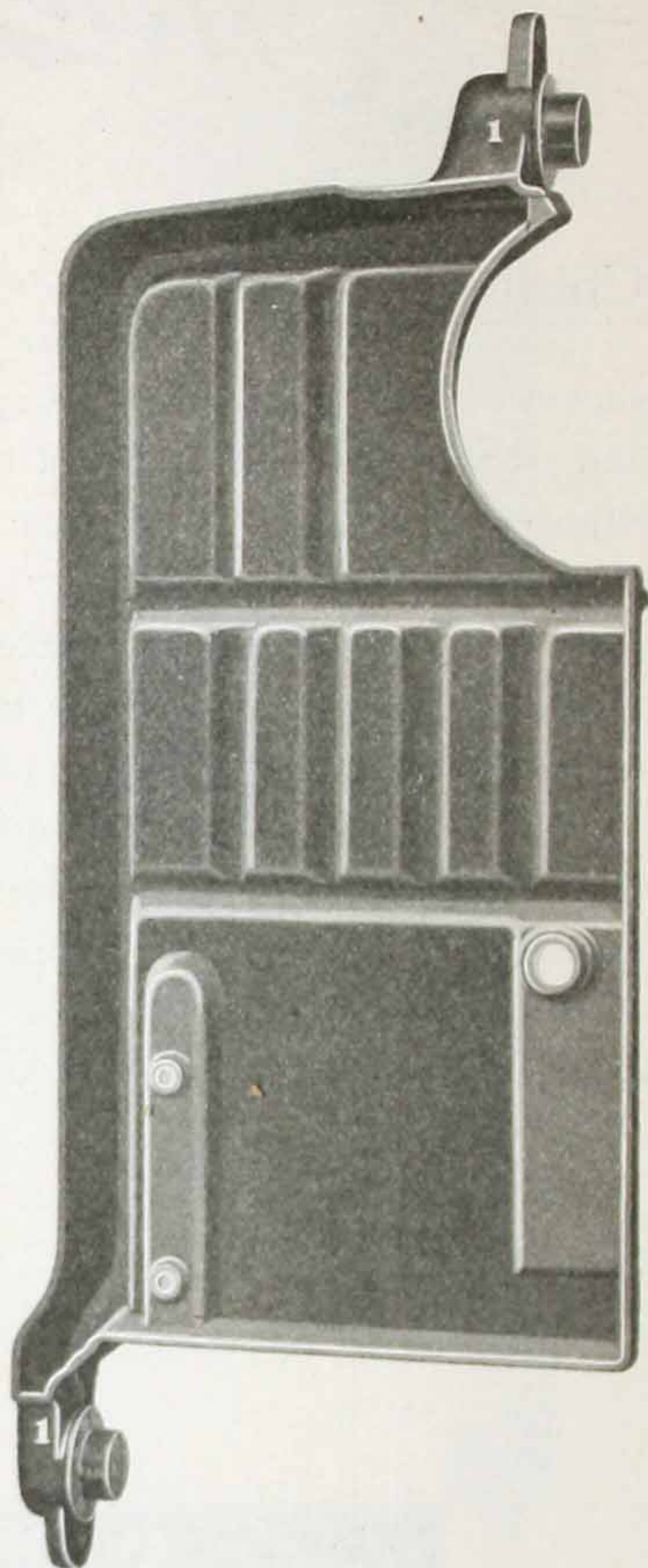
Chimneys. Our tables give the size of pipe collar which is on the heater and the connection to the chimney should be the same size. The opening in chimney should be larger and proportioned to the size of building. For ordinary houses no chimney should be smaller than 9" diameter inside, or 8" x 8" if square, or 8" x 12" if oblong. Locate the heater flue as near the centre of the building as possible. Make it full size throughout its length and extend it above the highest point of the roof. Do not connect a range or stove to the heater flue.

In proportion to area, round flues are most effective, then square, then oblong. Long and narrow flues are a great detriment to the operation of any heater. Proper chimneys and draft is a subject little understood, but the cause of a great many cold houses and complaints against heaters and heating apparatus.

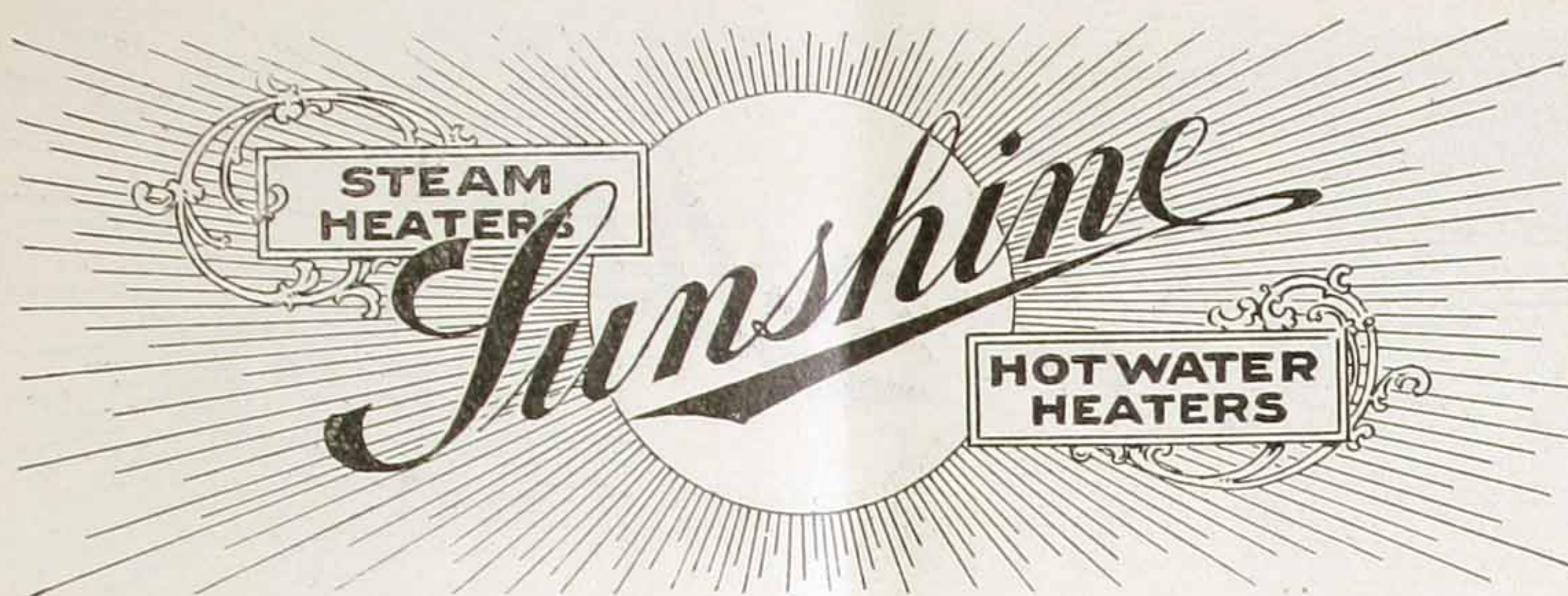




$\frac{1}{2}$ of Monarch Front Section.
 4I Series. Water.
 (Open view showing waterways and doors.)



$\frac{1}{2}$ of Monarch Back Section.
 4I Series. Water.
 (Open view showing waterways and
 smoke pipe attachment.)



Monarch Sunshine Heaters.

Realizing that hot water and steam heating is being more generally used for large buildings, such as public halls, churches, school houses, hotels and stores, we have made our Monarch Sunshine Heater to supply this trade. It is made in two series, one with a 41-inch grate and one with a 25-inch grate in sizes as given on pages 38-41.

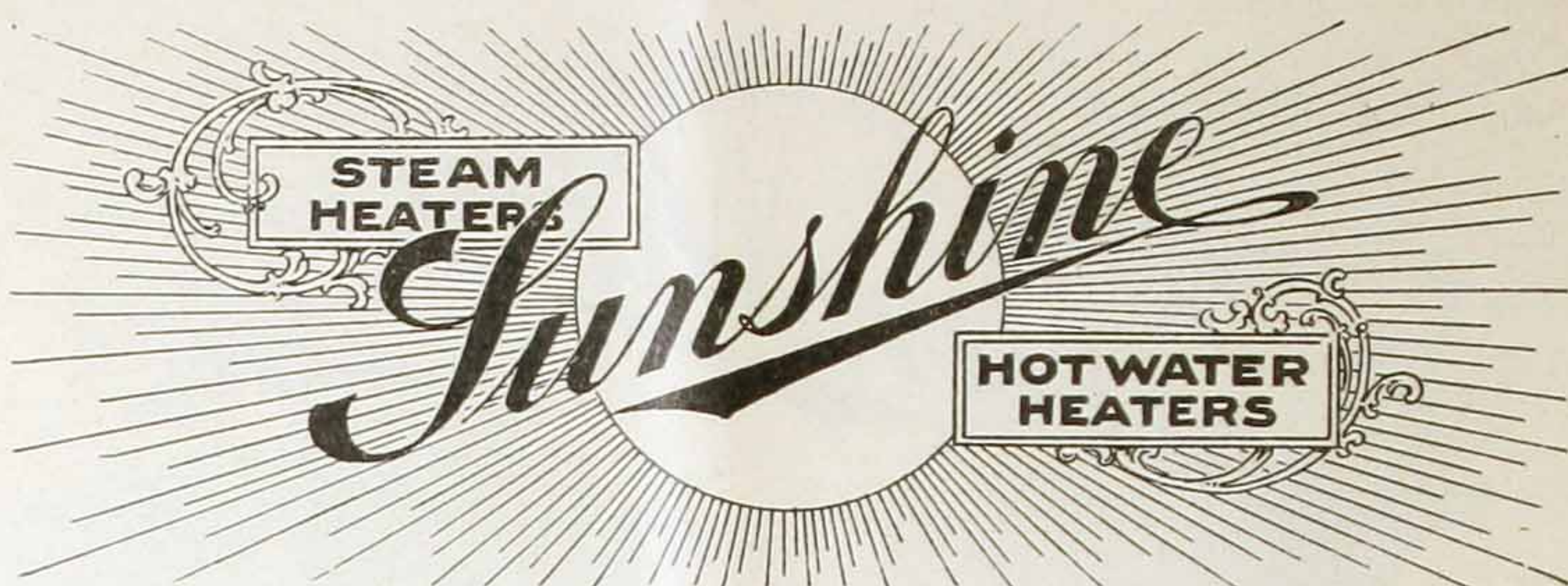
Monarch Base.

The ash-pit base is made in three pieces, the back connection being hollow and joined to the sides by slip nipples. This allows the base to be made in castings of moderate weight so as to be easily handled and also making a positive connection.

Monarch Sections.

The sections of the Monarch Sunshine are divided into halves and connected at the top to the header and at the bottom to the base sides. For a large heater this arrangement affords a casting easy to handle and easy to remove in case of repair. Any section can be removed without tearing down the heater or interfering with the operation, providing the connections are plugged. By reference to the cuts on pages 10-12 you will see that the steam section differs from the water. A large number of manufacturers use the same section for water and steam, but realizing that a practice of that kind was not the most modern or economical, we have designed this heater with two styles of section.

In the water heater the quantity of water is small with many waterways, giving large heating surfaces and a very efficient heater. The steam section has been made larger at the top and sides, thus



increasing the waterways and giving a larger space for steam. This gives a larger volume of water in the steam heater, a freer circulation within its waterways, and ample space for the formation of steam.

Monarch Circulation.

The circulation in the Monarch Sunshine is all vertical as in our other heaters. The numerous waterways give ample space for the hot water to ascend freely into the connecting header at the top and then through the system. The return pipes from the system are all connected to the ash-pit base, which is a hollow casting connected to each section on both sides. This arrangement allows ample space and permits free distribution of the cold water to each section and through them to all parts of the heating surface.

Monarch Heating Surface.

Our illustration on page 6 shows that the draft is directly vertical from all parts of the grate into the drop flues over the fire. These are then necessarily all direct prime heating surface. Then the products of combustion are drawn to the outer flues on each side of the heater and pass upward into the top row of flues. At every point of heater they are now drawn toward the centre through the tortuous paths made by the staggered waterways, into the central flue, then they are drawn back the entire length of heater into the smoke pipe. This arrangement obtains a large proportion of direct fire surface in the drop flues, an equal draft over the entire surface of grate, and a sufficiently long travel in the upper flues to utilize the maximum amount of heat from the coal.



MONA
Also made f



IMPERIAL SUNSHINE STEAM HEATER.
For sizes, etc., see page 42.



Imperial Sunshine Heaters. This heater has been in use several years and has proved by the large number installed in all sections of the country to be efficient and economical. It is used for all medium sized dwellings and for small churches and school houses. Sizes and ratings are given on page 42, 43.

Imperial Sections. The Imperial Sunshine Section is made in one piece, being a smaller sectional heater and each casting can be easily handled. The large connection at the top gives ample circulation and egress for the water or steam to the pipes and the system. The connections at the bottom on each side allow a close connection between the sections, and free circulation for the colder return water to every part of the heater.

Imperial Joint. The sections are joined by three push nipples and fastened by four bolts, two at top and one on each side. These bolts run through specially cored holes, and do *not* enter the water section, thus preventing rusting and obviating packed joints.

Imperial Circulation. In the Imperial Sunshine the circulation is vertical throughout and exceptionally free in its movement. Each section is practically an independent heater, thus maintaining a steady water line without equalizing or circulating pipes. The vertical circulation causes a rapid flow of water from the bottom to top of heater, thus bringing the cold water continually in contact with the highest heated surfaces. The large connections at the sides and top of each section give

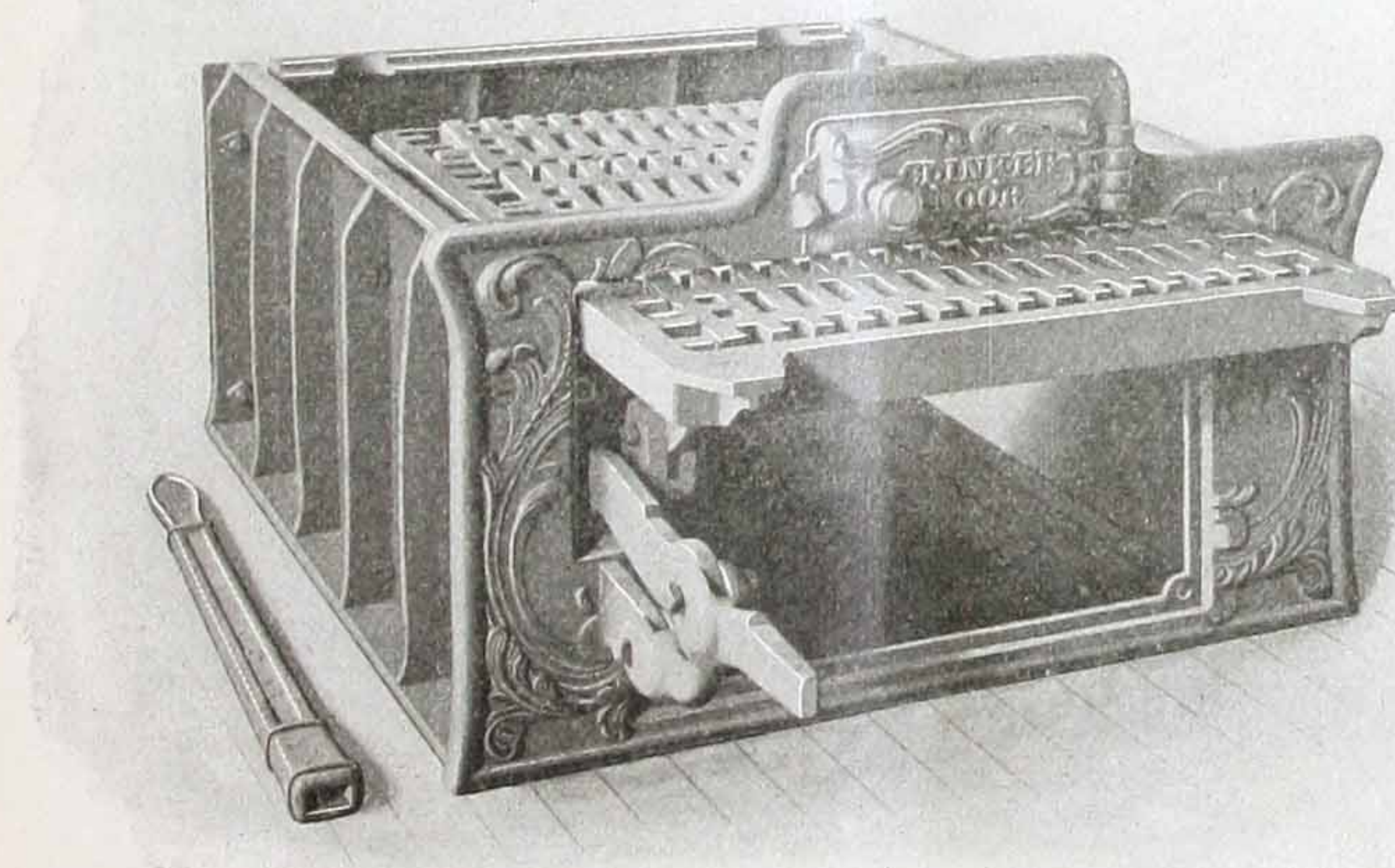


IMPERIAL SUNSHINE STEAM HEATER—OPEN VIEW SHOWING DRAFT.

For sizes, etc., see page 42.



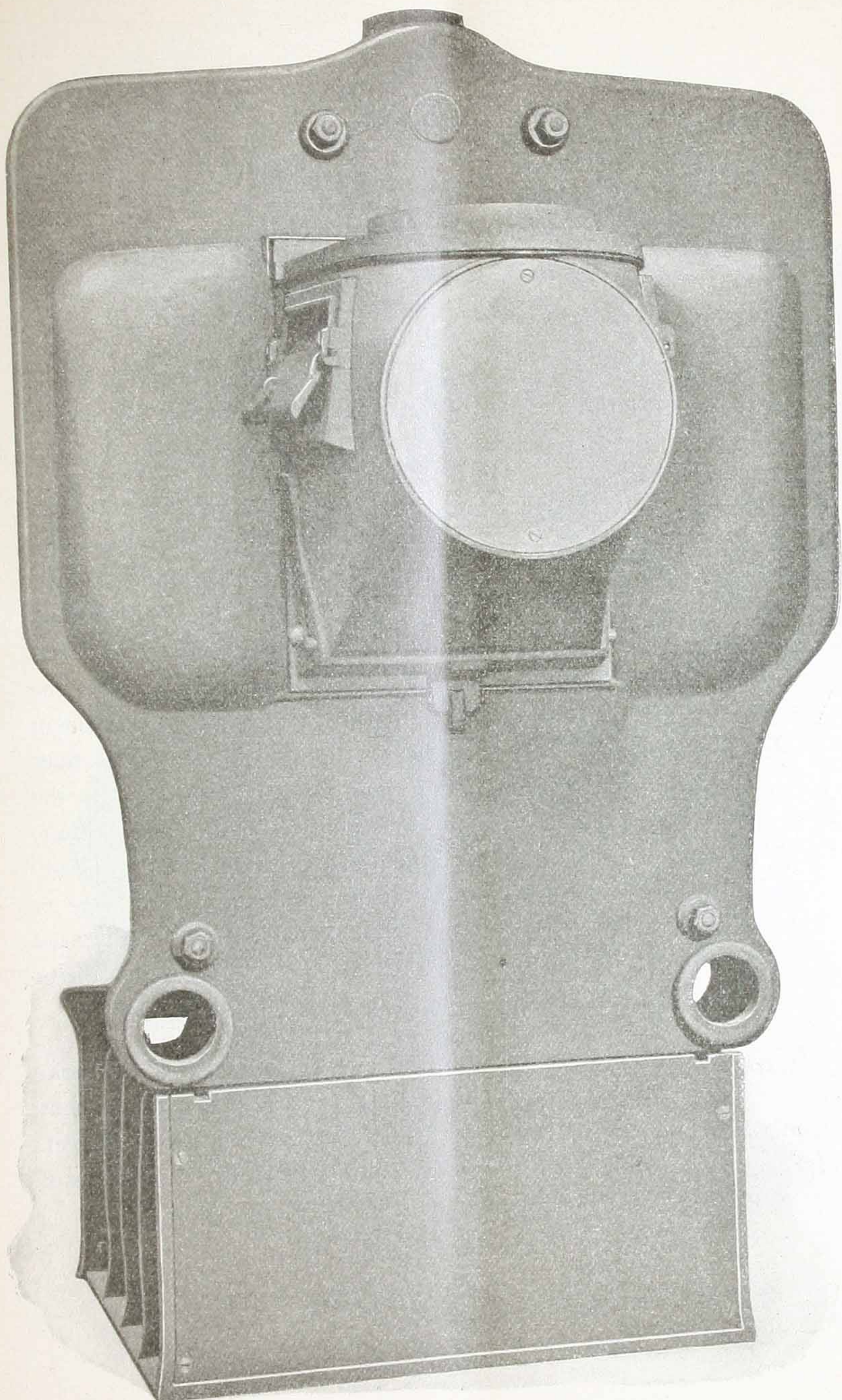
IMPERIAL SUNSHINE BASE WITH GRATE.



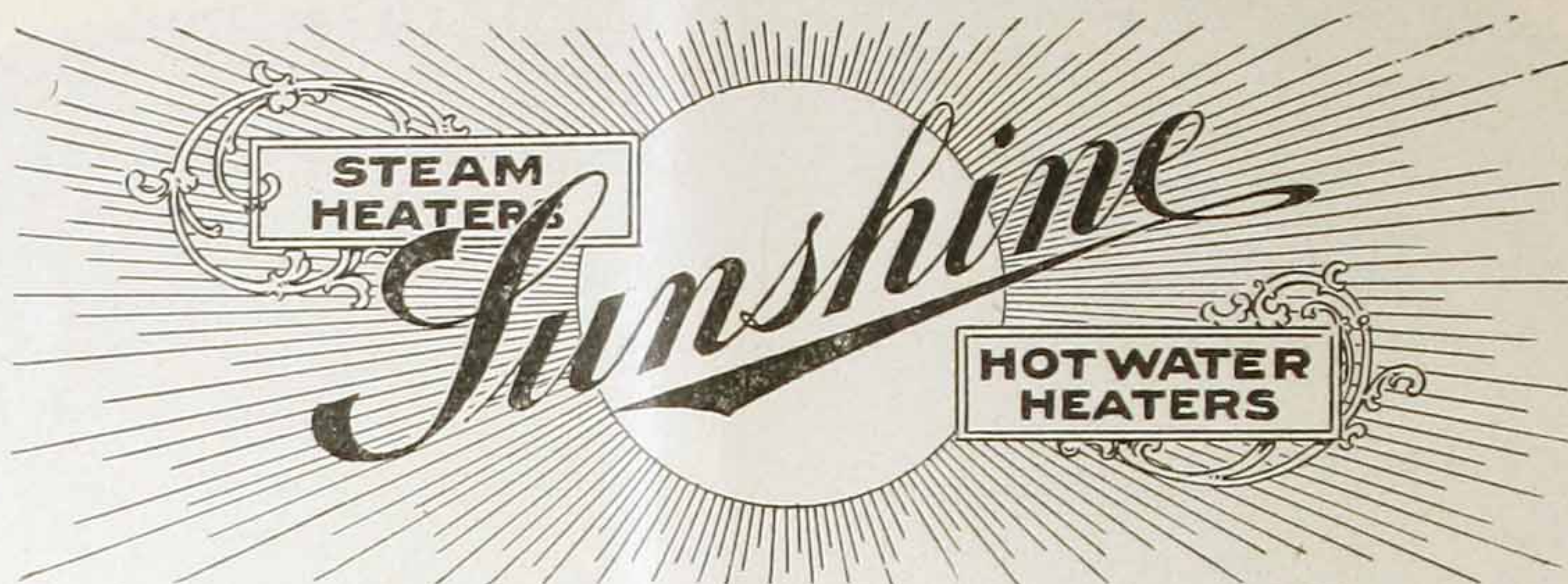
SHOWING GRATE PARTLY REMOVED.



IMPERIAL SUNSHINE WATER HEATER.
For sizes, etc., see page 43.



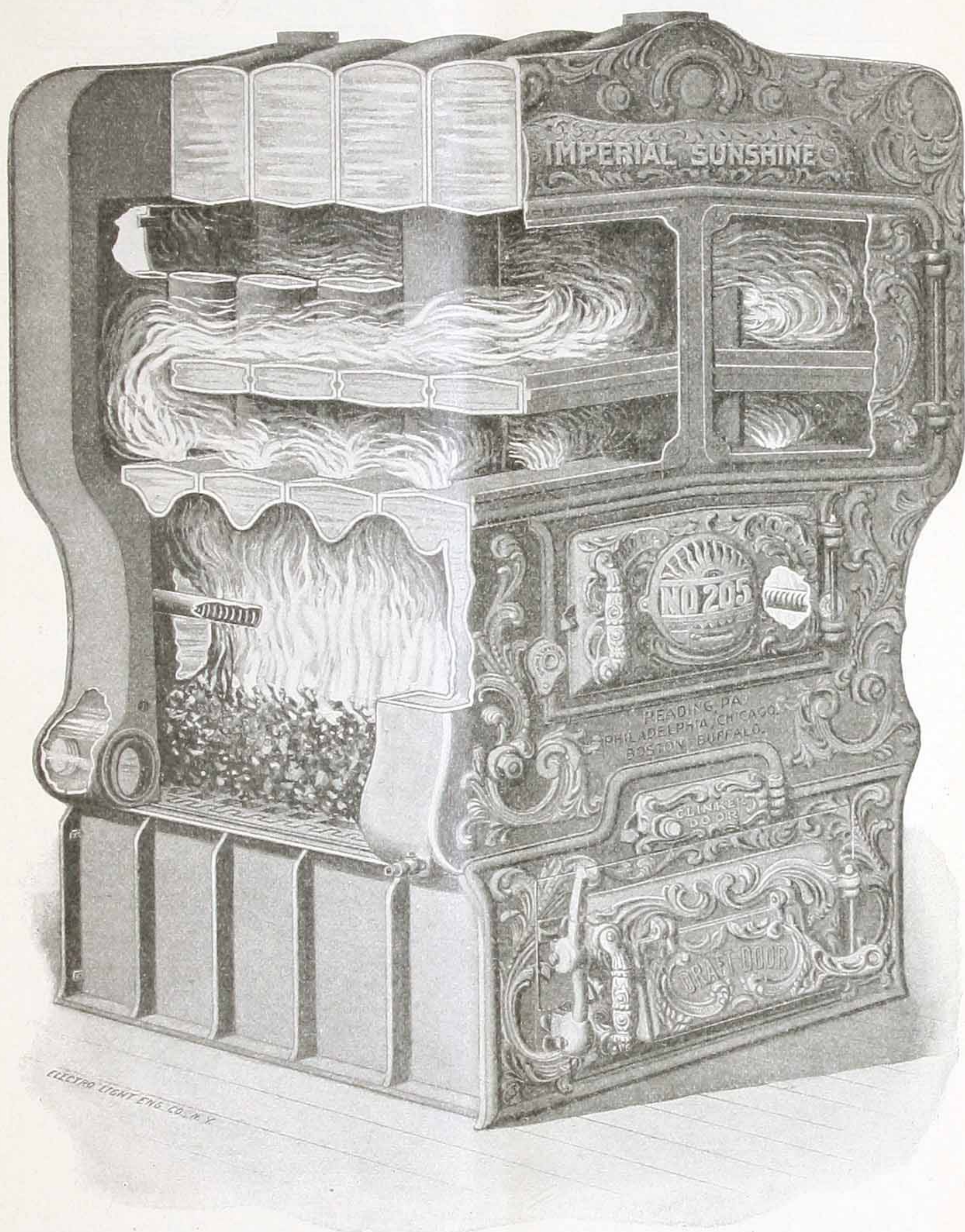
REAR VIEW SHOWING SMOKE HOOD AND TAPPINGS FOR RETURN.
IMPERIAL SUNSHINE HEATER.



ample room for the free flow of water or steam throughout the heater and into the heating system.

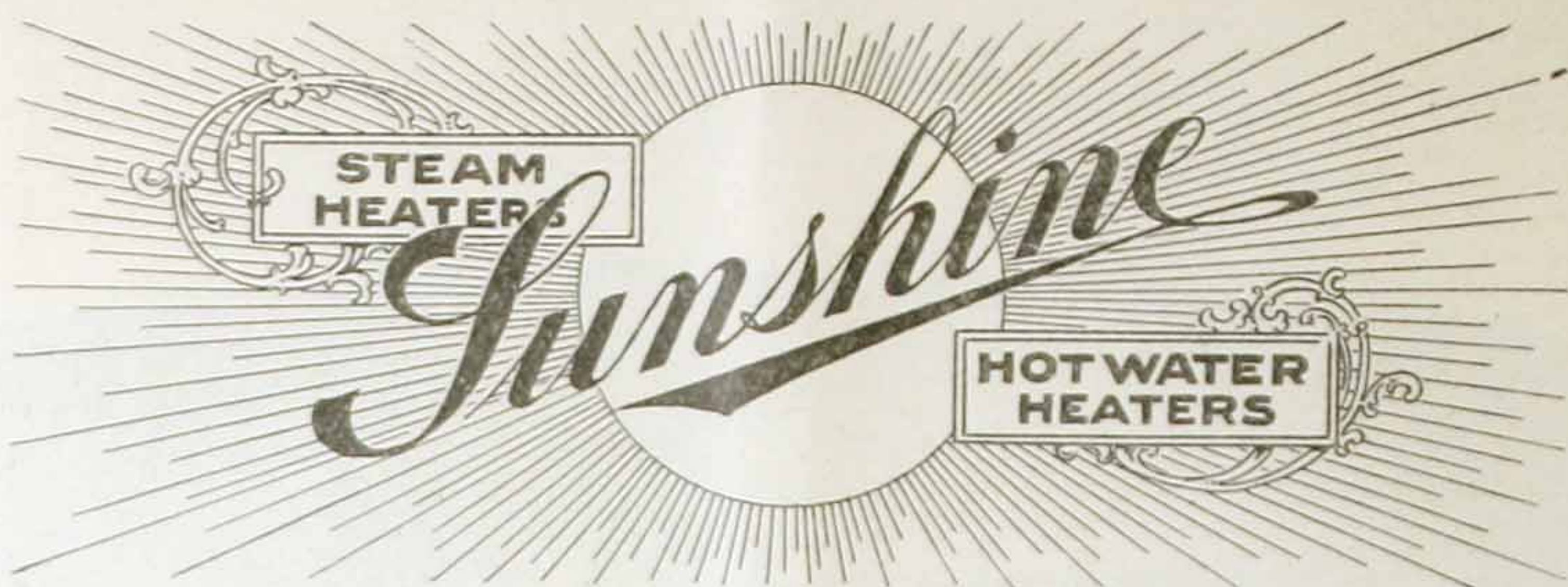
Imperial Heating Surface. In our Imperial Sunshine Heater our illustration on page 27 shows that we have a series of vertical openings between the sections leading into the shallow flues directly over the fire, equalizing the heat and materially increasing the direct fire surface. This draws the flame upward from every part of the grate into the lower row of flues, then back until they rise to the upper row of flues, passing to the front of the heater through the two outer flues and back to the rear through the inner flues, and thence into the smoke pipe—traveling three times the entire length of the heater. This arrangement also equalizes the draft, assuring perfect combustion all over the surface of the grate. The open view on page 27 shows the smoke passage ways in one-half of the heater only, the other being exactly the same. This heater is provided with a direct draft damper for use in starting a fresh fire.

Imperial Grate. The Imperial Sunshine Grate is of the rocking and dumping type, a simple attachment on the shaking lever insuring the grates always being left level. These grates can be easily removed and have all the advantages of the Monarch Grate as described on page 19.



IMPERIAL SUNSHINE WATER HEATER—OPEN VIEW.

For sizes, etc., see page 43.



Vestal Sunshine Heaters. The Vestal Sunshine Heaters have been made to supply the demand for a small compact heater to be used in small and medium sized residences, offices and conservatories. The water heater can also be used as a tank heater for heating water for bath rooms, barber shops and all domestic purposes. Our illustrations show two styles, the full-revertible flue pattern and the half-revertible flue pattern. They are practically the same heater except that the full-revertible has the cast-iron casings around the fire-pot forming a return flue; the draft is then diverted by the side flue strips so as to send the products of combustion down the outside of the fire-pot before going to the smoke pipe. Both styles are provided with a direct draft damper.

The Cast-iron Casing forming the return flue will for years outlast the Galvanized Sheet-iron Casings used on most heaters.

It is an economy but not a necessity to cover this heater. We will furnish Asbestos Cement for covering it when specially ordered at regular market prices.

The cast-iron bottom of the ash-pit is constructed so that the heater can be set on a wood floor allowing an air space between heater and foundation.

Vestal Construction. The illustrations show the construction of the Vestal Sunshine Water and Steam Heaters. The fire-pot and combustion chamber is a single bell-shaped casting, all sides of which are hollow. Connected with the top of this by a four-inch slip nipple is a half sphere-shaped



A. Mugford Hfa. (r.)

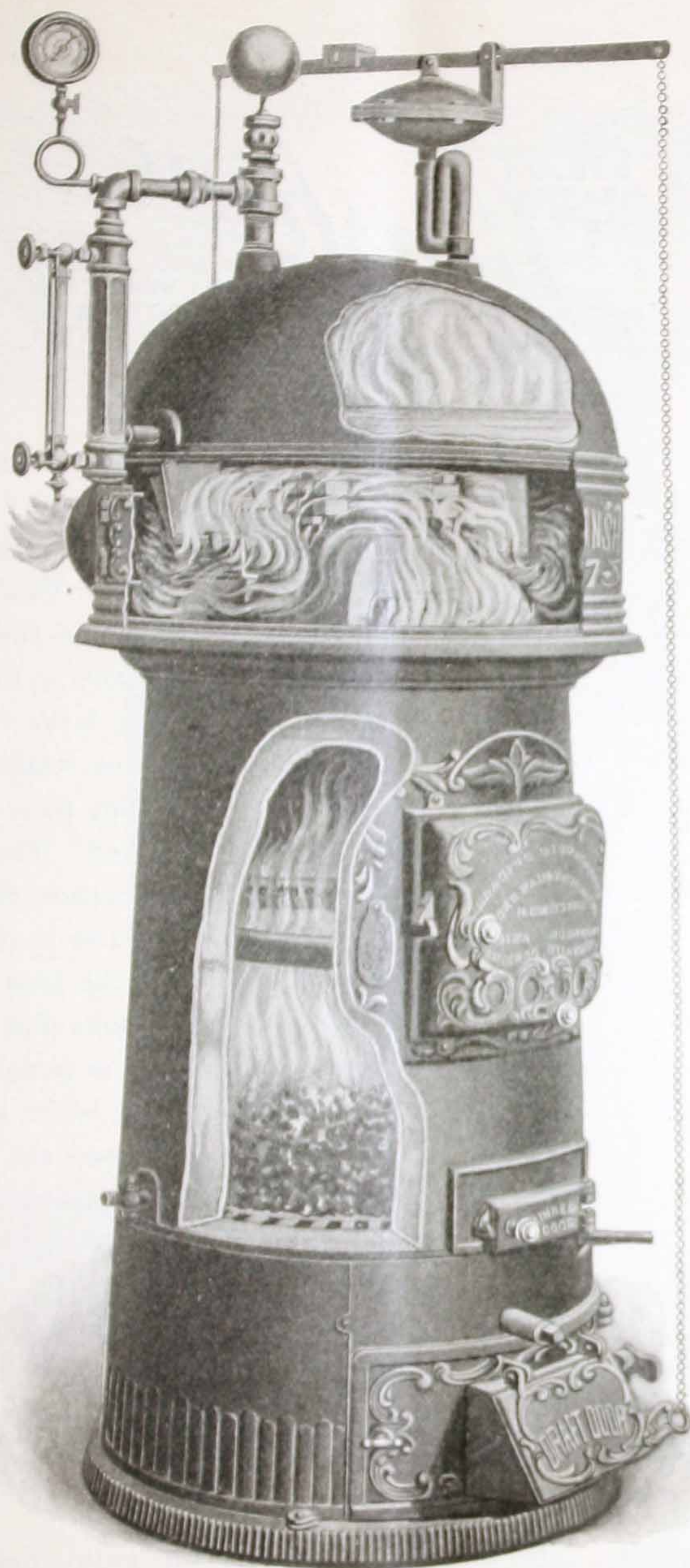
VESTAL SUNSHINE STEAM HEATER.
FULL-REVERTIBLE FLUE PATTERN.

For sizes, etc., see page 44. All Vestal Steam Heaters have lower water column connections as here shown.



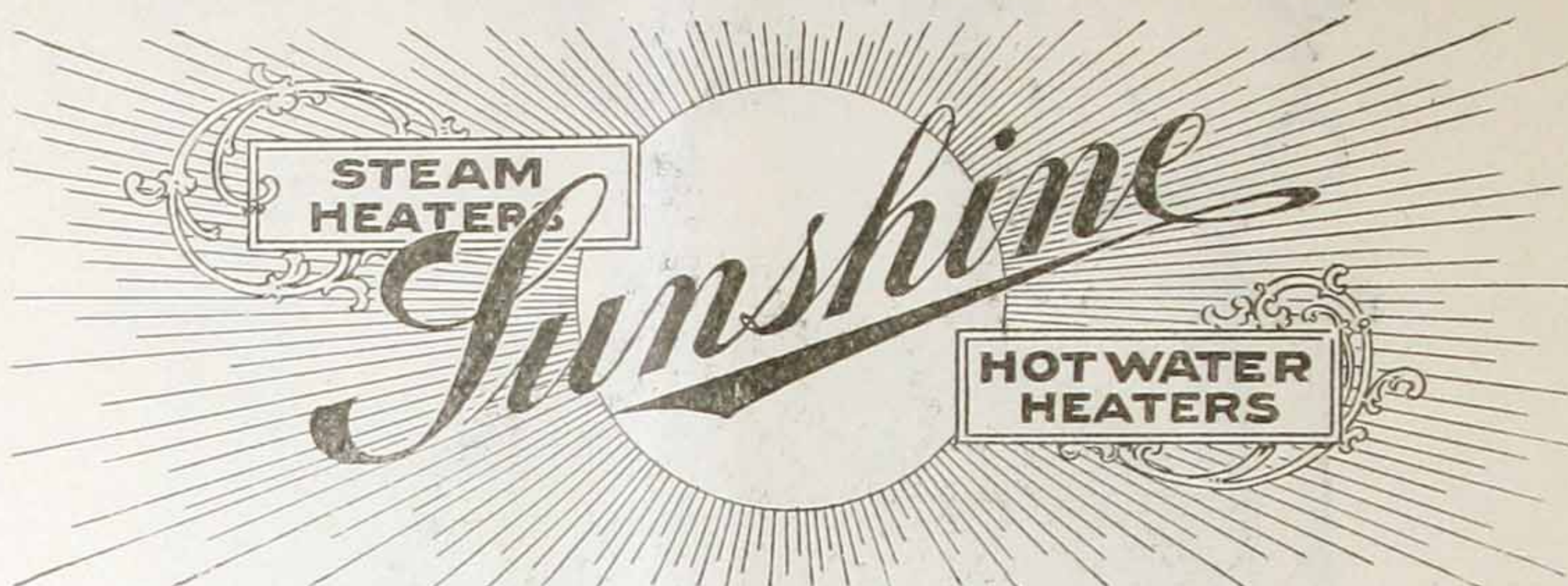
VESTAL SUNSHINE STEAM HEATER—OPEN VIEW.
FULL-REVERTIBLE FLUE PATTERN.

For sizes, etc., see page 44. All Vestal Steam Heaters fitted with lower water connection as shown on page 29.



VESTAL SUNSHINE STEAM HEATER—OPEN VIEW.
HALF-REVERTIBLE FLUE PATTERN.

For sizes, etc., see page 44. All Vestal Steam Heaters fitted with lower water connection as shown on page 29.



water section or dome. Outside of the fire-pot and combustion chamber there is a cast-iron vertical sectional casing of such diameter that the annular space within forms a revertible flue through which the gases travel on their way to the smoke pipe. This casing extends from the top of the ash-pit base to the bottom of the dome.

The fire-pot and combustion chamber being smaller in diameter at the top than at the bottom, the gases as they leave the fuel impinge against the sides. The top being concave retards their progress and gives them a rolling motion that retains them in the combustion chamber until they are thoroughly ignited. Then they pass through the opening at the top of the combustion chamber and, striking squarely against the dome, their course is reversed down through one-half of the revertible flue to the base of the heater and then up through the other half to the smoke pipe. The gases, in traveling through this revertible flue, come in contact with the outside of the water sections, imparting to the water a large percentage of heat that in other heaters passes unused out of the chimney. This construction, in connection with our gas consuming device, described on page 9 produces a most perfect combustion and insures most economical results.

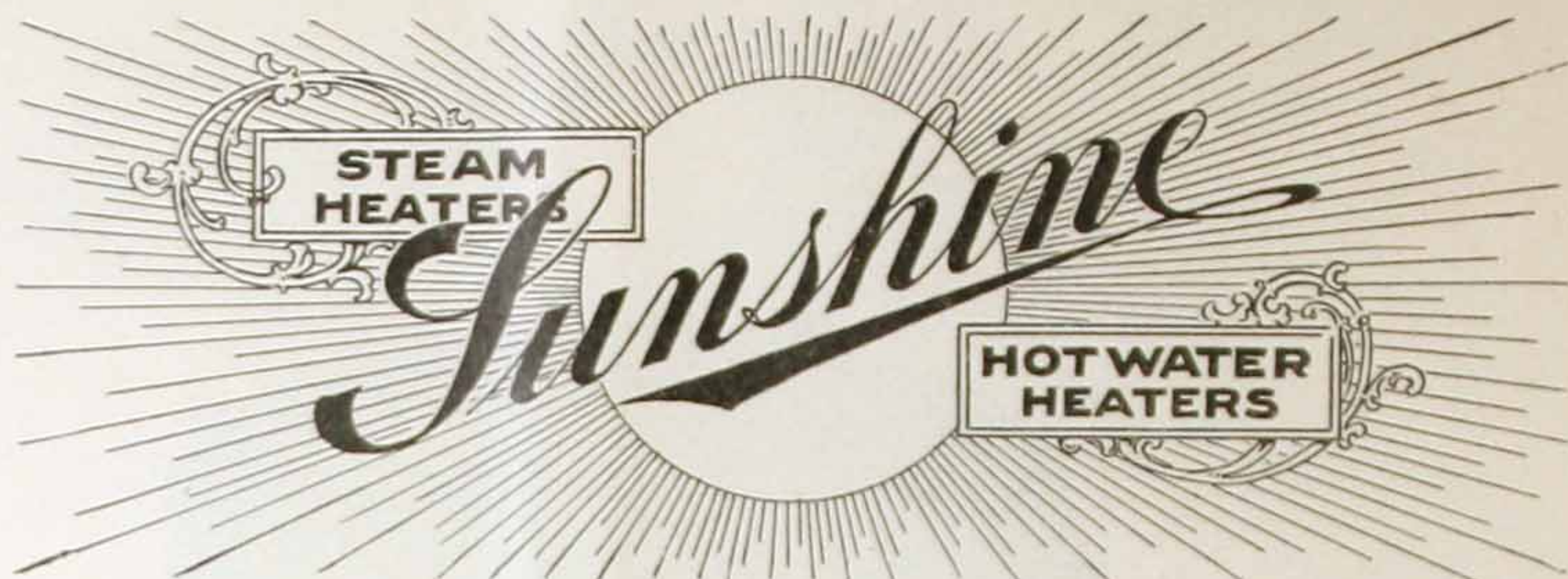
Every inch of heating surface can be thoroughly and easily cleaned through the removable panel and clean-out door on each side of the heater—the former near the bottom and the latter at the top of the return flue.

Vestal Joint. The only water joint in the entire heater is the one connecting the fire-pot with the dome, in which we use a four-inch slip nipple made of extra heavy iron



VESTAL SUNSHINE WATER HEATER.
FULL-REVERTIBLE FLUE PATTERN.

Showing panel removed for cleaning flues. For sizes, etc., see page 45.



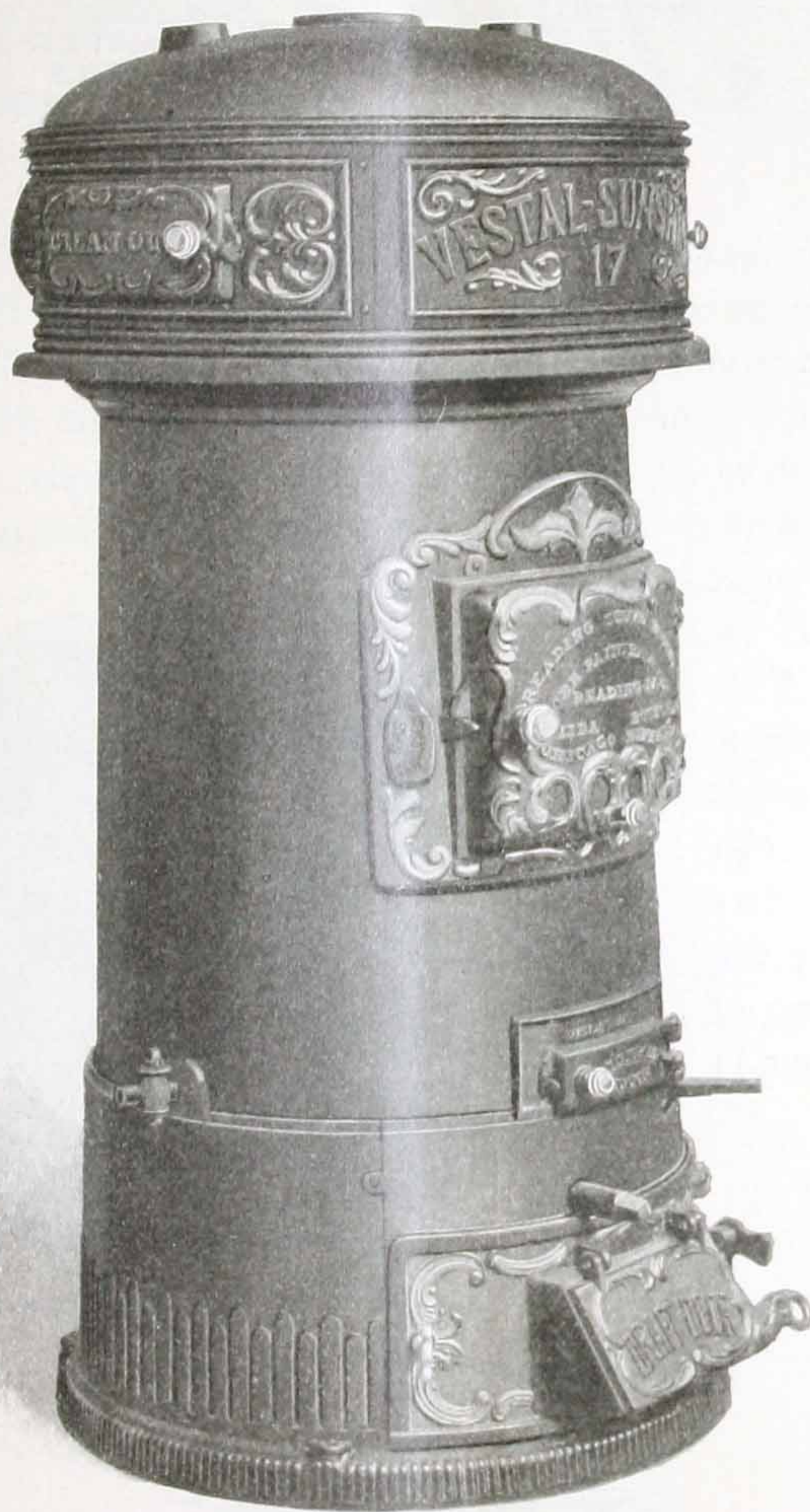
tubing. The castings are drawn together on this nipple by three bolts, located outside of the waterways, so that the gases do not come in contact with the nipple. This makes a most excellent joint; easy to make tight, easy to take apart, and durable.

Vestal Circulation. The circulation in the Vestal Sunshine, as in all our constructions, is vertical throughout. The quantity of water is as small as is compatible with the work it is intended to do; is divided into thin sheets with heat on both sides of it, and leaves the heater at a point where the products of combustion are the hottest, thus producing wonderfully quick results and reducing the friction to the lowest possible point.



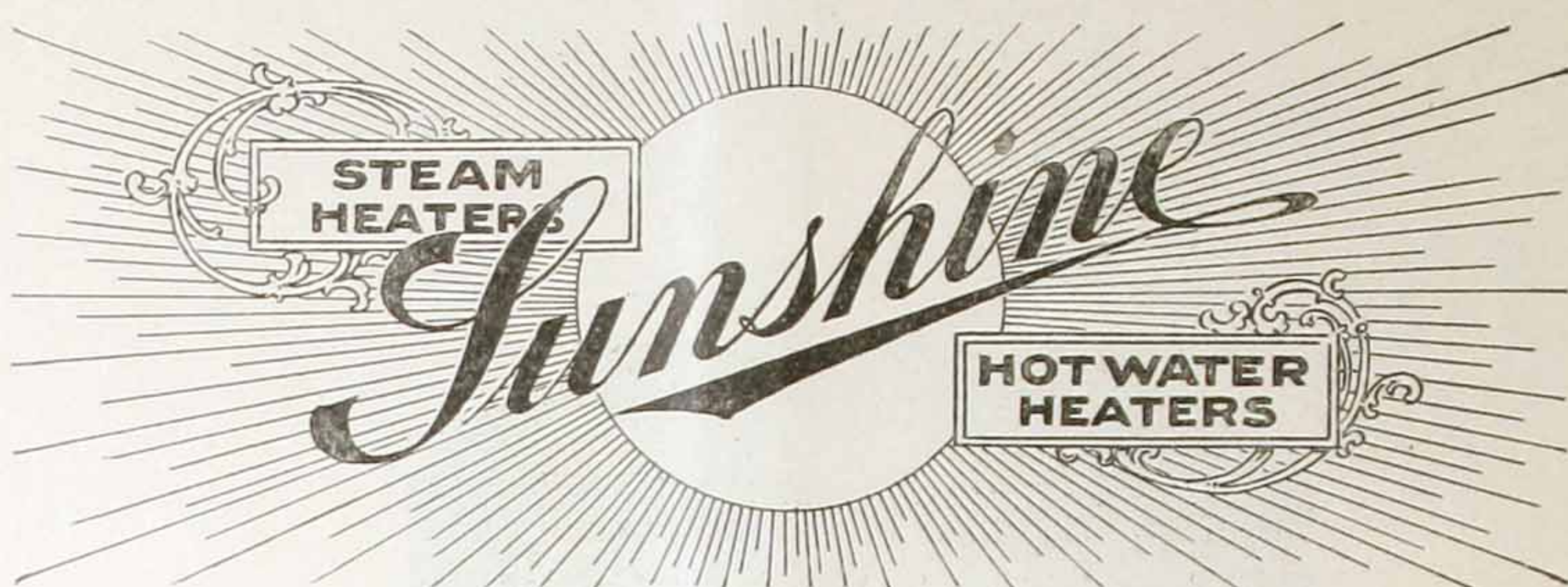
The Grate is of the type known as the Ransom Duplex, the best round grate ever designed, and, while used for many years in heating stoves, this is the first time it has been applied to steam or water heaters. The shaking of the grate ring removes the ashes and clinkers

from the edges of the fire-pot, and the top surface of the grate

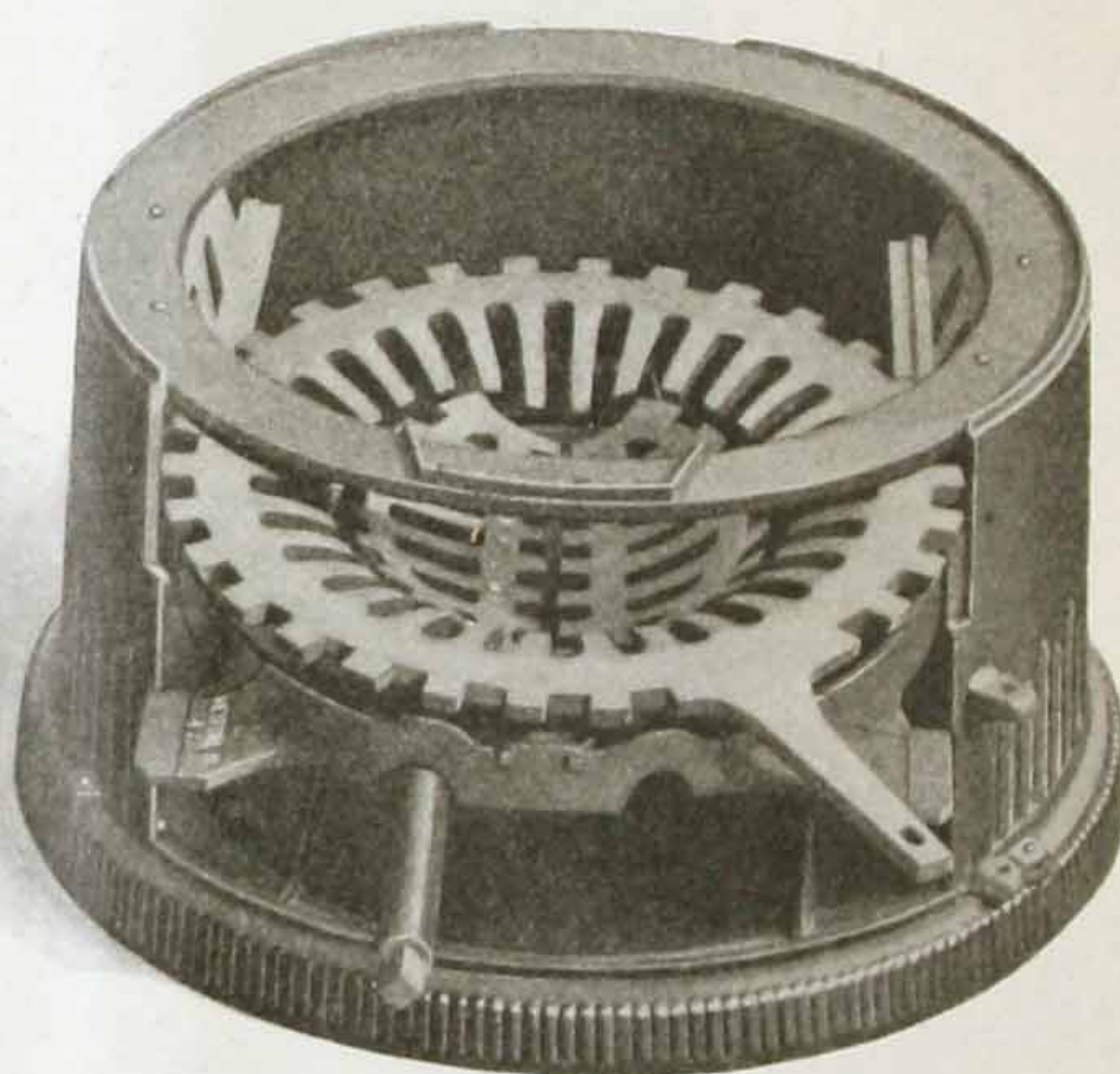


VESTAL SUNSHINE WATER HEATER.
HALF-REVERTIBLE FLUE PATTERN.

For sizes, etc., see page 45.



being concave, what does not pass through the openings in the ring is forced to the centre, where it is discharged through the Duplex Centre Grate into the ash-pit, leaving the fire in the best possible condition for economical results, free from ashes and clinkers, and loose enough to allow the draft to pass through freely. An anti-clinker door is provided, through which a slicing bar can be used over the entire surface of the grate. The entire grate, with frame, can be removed for repairs by the unscrewing of two small bolts.

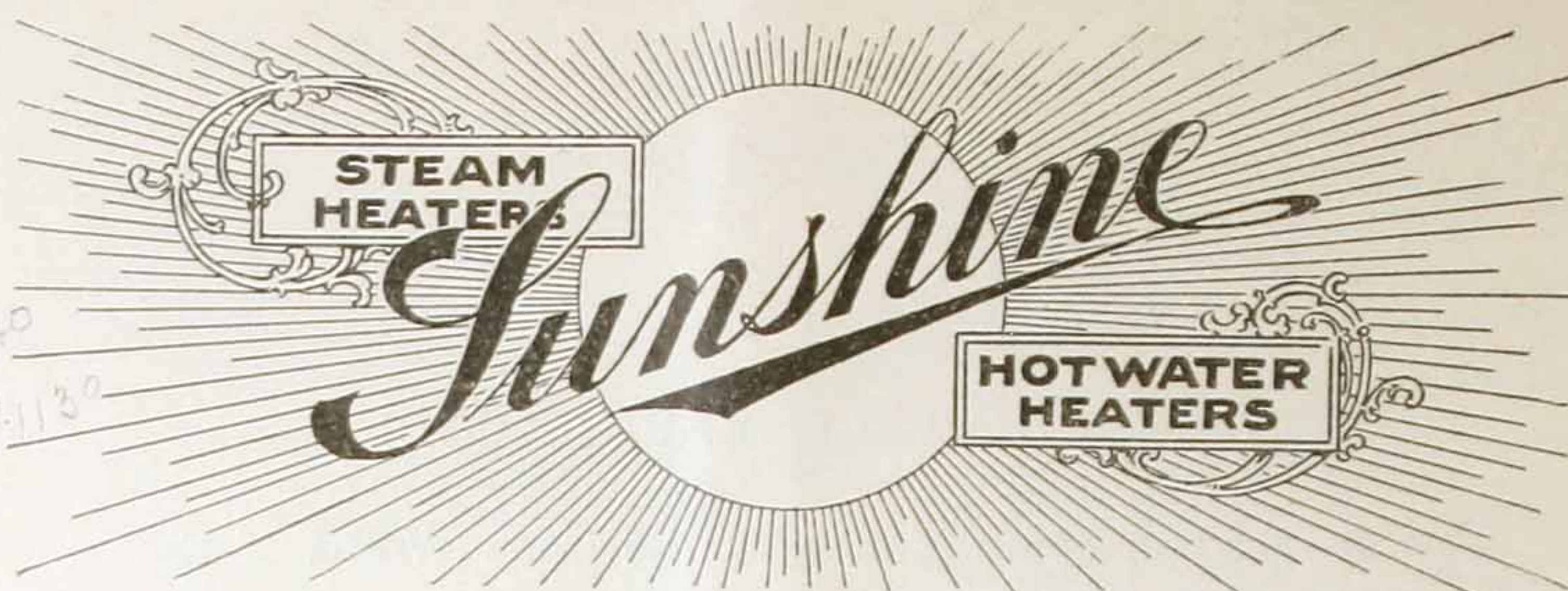


GENERAL TELEGRAPHIC CODE.

To be used in connection with the Code Words of the
Price Lists.

Stanza . . .	Telegraph how soon you can ship.
Sabal	Ship immediately by freight.
Sabbath . . .	Ship immediately by express.
Staple	Get ready for immediate shipment, will send directions by mail.
Stark	Have you shipped our order of.....
Startle . . .	Your order was shipped.
Sabian	Change our order to read.
Saccharine .	If order has not been shipped.
Saber	Add to our order of.....
Statistic . .	When will order of..... be shipped.
Staunch . . .	Trace shipment of.....
Sabot	Quote prices on.
Staves	F. O. B. Reading.
Steady	With fifteen cent freight allowance to.....
Steadfast . .	With full freight allowance to.....
Steed	We have received your order of.....
Stencil	We cannot accept your order of.....
Stickler . . .	We accept your order.
Stifle	Can ship immediately.
Stigma	Can ship in.....days.

Cable address, "SUNSHINE, READING."



41 SERIES. Monarch Sunshine Heater. STEAM.

No. of Heater,	416	417	418	419	4110
Rating, sq. ft.,	1600	1950	2300	2700	3150
Price, (See note),	\$515.00	580.00	650.00	725.00	810.00
No. of Sections,	6	7	8	9	10
Size of Grate, inches,	41×30	41×36	41×42	41×48	41×54
Area of Grate, sq. inches,	1230	1476	1722	1968	2214
Width of Base at foundation line, inches,	43	43	43	43	43
Depth of Base at foundation line, inches,	45	51	57	63	69
Height of Heater to top of outlet, inches,	67	67	67	67	67
Greatest width of Heater, including trimmings, inches,	64	64	64	64	64
Depth of Heater, with smoke pipe and shaker, inches,	58	65	71	78	84
Height of Water Line, inches,	58	58	58	58	58
Diameter of Smoke Pipe or Elbow, inches,	14	15	15	16	16
Height from floor to centre of return opening, inches,	6	6	6	6	6
Tappings for Flow Pipe,	3—4"	3—4"	4—4"	4—4"	4—4"
Tappings for Return Pipe,	4—4"	4—4"	4—4"	4—4"	4—4"
Telegraph Code,	Mild	Mimic	Mine	Minor	Miracle

We furnish sufficient **Asbestos Cement** to provide an inch covering for the heater, also trimmings, consisting of Poker, Slice Bar, Flue Brush, Scraper and Steam Trimmings, (draft regulator, safety valve, steam gauge, gauge cocks and water column).

Above ratings are based upon an indicated pressure of 2 lbs. at the boiler, and provide that, in estimating the size of boiler required, all piping (mains and risers, flow and return) shall be figured as radiating surface, in addition to the cast-iron direct radiation to be used.

When a pipe, coil or cast-iron section is introduced into the fire-pot, or a steam coil placed in a tank, for the purpose of heating water for domestic use, additional capacity should be provided in estimating size of boiler required, at the rate of 1¼ sq. ft. of direct radiation for each gallon of water to be thus heated per hour.

Guarantee: Our boilers are guaranteed to the extent of furnishing new castings for any found to be defective in manufacture. The foregoing ratings are conservatively made in accordance with accepted standards, but on account of the varying conditions surrounding the installation of a boiler we make no guarantee except as above.



41 SERIES. Monarch Sunshine Heater. WATER.

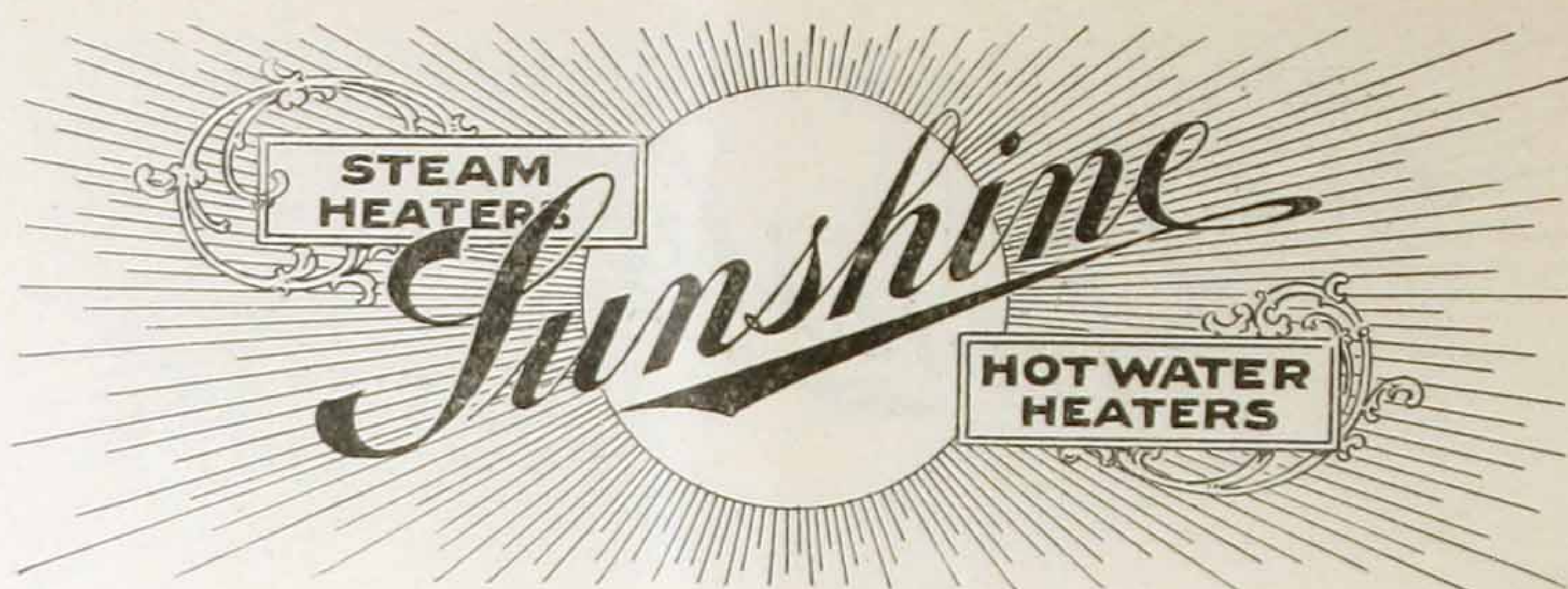
No. of Heater,	416	417	418	419	4110
Rating, sq. ft.,	2650	3200	3800	4450	5200
Price, (See note),	\$505.00	565.00	630.00	705.00	785.00
No. of Sections,	6	7	8	9	10
Size of Grate, inches,	41×30	41×36	41×42	41×48	41×54
Area of Grate, sq. inches,	1230	1476	1722	1968	2214
Width of Base at foundation line, inches,	43	43	43	43	43
Depth of Base at foundation line, inches,	45	51	57	63	69
Height of Heater to top of outlet inches,	67	67	67	67	67
Greatest width of Heater, inches,	54	54	54	54	54
Depth of Heater, with smoke pipe and shaker, inches,	58	65	71	78	84
Diameter of Smoke Pipe or Elbow, inches,	14	15	15	16	16
Height from floor to centre of return opening, inches,	6	6	6	6	6
Tappings for Flow Pipe,	3—4"	3—4"	4—4"	4—4"	4—4"
Tappings for Return Pipe,	4—4"	4—4"	4—4"	4—4"	4—4"
Telegraph Code,	Model	Modify	Moist	Monster	Month

We furnish sufficient **Asbestos Cement** to provide an inch covering for the heater, also trimmings consisting of Poker, Slice Bar, Flue Brush and Scraper.

Above ratings are based on a standard of water at a temperature of 180° Fahrenheit as it leaves the boiler, and provide that in estimating the size of boiler required, all piping (mains and risers, flow and return) shall be figured as radiating surface, in addition to the cast-iron direct radiation to be used.

When a pipe, coil or cast-iron section is introduced into the fire-pot for the purpose of heating water for domestic use, additional capacity should be provided in determining the size of boiler required, at the rate of two square feet of direct radiation for each gallon of water to be thus heated per hour.

Guarantee: Our boilers are guaranteed to the extent of furnishing new castings for any found to be defective in manufacture. The foregoing ratings are conservatively made in accordance with accepted standards, but on account of the varying conditions surrounding the installation of a boiler we make no guarantee except as above.



25 SERIES. Monarch Sunshine Heater. STEAM.

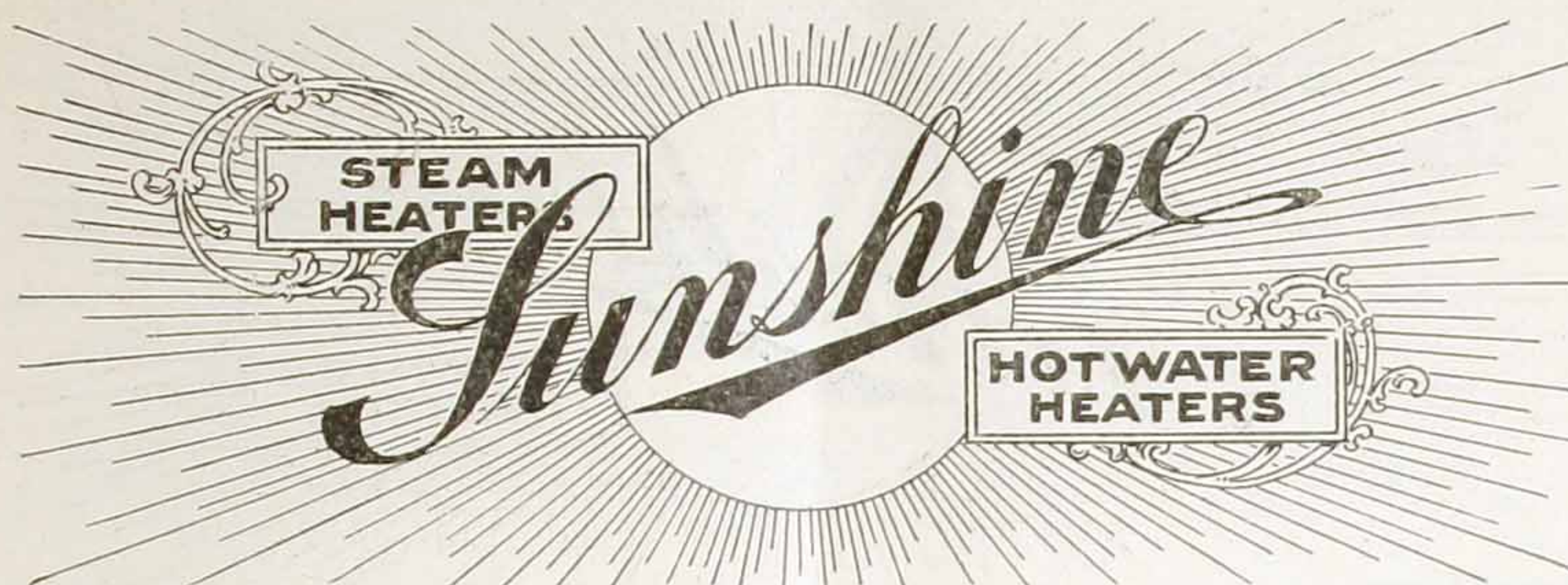
No. of Heater,	254	255	256	257	258	259
Rating, sq. ft.,	500	650	800	1000	1200	1450
Price, (See note),	\$215.00	255.00	295.00	345.00	410.00	485.00
No. of Sections,	4	5	6	7	8	9
Size of Grate, inches,	25×18	25×24	25×30	25×36	25×42	25×48
Area of Grate, sq. inches,	450	600	750	900	1050	1200
Width of Base at foundation line, inches,	27	27	27	27	27	27
Depth of Base at foundation line, inches,	33	39	45	51	57	63
Height of Heater to top of outlet, inches,	67	67	67	67	67	67
Greatest width of Heater, including trimmings, inches,	48	48	48	48	48	48
Depth of Heater, with smoke pipe and shaker, inches,	44	50	57	63	70	76
Diameter of Smoke Pipe or Elbow, inches,	12	12	13	13	14	14
Height of water line, inches,	58	58	58	58	58	58
Height from floor to centre of return opening, inches,	6	6	6	6	6	6
Tappings for Flow Pipe,	2—4"	2—4"	3—4"	3—4"	4—4"	4—4"
Tappings for Return Pipe,	3—4"	3—4"	3—4"	3—4"	3—4"	3—4"
Telegraph Code,	Meadow	Meal	Medal	Melon	Mental	Mercy

We furnish sufficient **Asbestos Cement** to provide an inch covering for the heater, also trimmings, consisting of Poker, Slice Bar, Flue Brush, Scraper and Steam Trimmings, (draft regulator, safety valve, steam gauge, gauge cocks and water column).

Above ratings are based upon an indicated pressure of 2 lbs. at the boiler, and provide that, in estimating the size of boiler required, all piping (mains and risers, flow and return) shall be figured as radiating surface, in addition to the cast-iron direct radiation to be used.

When a pipe, coil or cast-iron section is introduced into the fire-pot, or a steam coil placed in a tank, for the purpose of heating water for domestic use, additional capacity should be provided in estimating size of boiler required, at the rate of 1¼ sq. ft. of direct radiation for each gallon of water to be thus heated per hour.

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25 SERIES.

Monarch Sunshine Heater.

WATER.

No. of Heater,	254	255	256	257	258	259
Rating, sq. ft.,	825	1050	1300	1650	2000	2400
Price, (See note),	200.00	235.00	275.00	330.00	395.00	470.00
No. of Sections,	4	5	6	7	8	9
Size of Grate, inches,	25×18	25×24	25×30	25×36	25×42	25×48
Area of Grate, sq. inches,	450	600	750	900	1050	1200
Width of Base at foundation line, inches, . .	27	27	27	27	27	27
Depth of Base at foundation line, inches, . .	33	39	45	51	57	63
Height of Heater to top of outlet, inches, . .	67	67	67	67	67	67
Greatest width of Heater, inches,	38	38	38	38	38	38
Depth of Heater, with smoke pipe and shaker, inches,	44	50	57	63	70	76
Diameter of Smoke Pipe or Elbow, inches, . .	12	12	13	13	14	14
Height from floor to centre of return opening, inches,	6	6	6	6	6	6
Tappings for Flow Pipe,	2—4"	2—4"	3—4"	3—4"	4—4"	4—4"
Tappings for Return Pipe,	3—4"	3—4"	3—4"	3—4"	3—4"	3—4"
Telegraph Code,	Mad	Maggot	Man	Manage	Mangle	Marine

We furnish sufficient **Asbestos Cement** to provide an inch covering for the heater, also trimmings consisting of Poker, Slice Bar, Flue Brush and Scraper.

Above ratings are based on a standard of water at a temperature of 180° Fahrenheit as it leaves the boiler, and provide that in estimating the size of boiler required, all piping (mains and risers, flow and return) shall be figured as radiating surface, in addition to the cast-iron direct radiation to be used.

When a pipe, coil or cast-iron section is introduced into the fire-pot for the purpose of heating water for domestic use, additional capacity should be provided in determining the size of boiler required, at the rate of two square feet of direct radiation for each gallon of water to be thus heated per hour.

Guarantee : Our boilers are guaranteed to the extent of furnishing new castings for any found to be defective in manufacture. The foregoing ratings are conservatively made in accordance with accepted standards, but on account of the varying conditions surrounding the installation of a boiler we make no guarantee except as above.



Imperial Sunshine Heater.

STEAM.

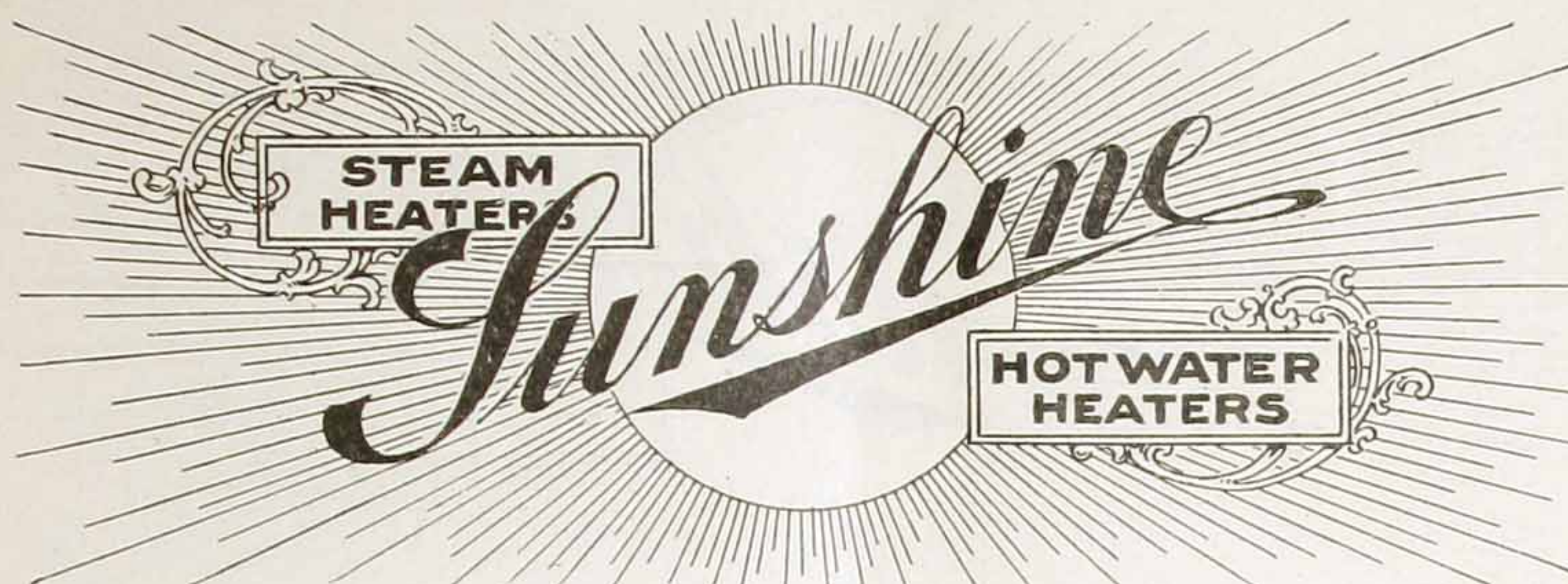
No. of Heater,	204	205	206	207	208	209
Rating, sq. ft.,	400	550	700	900	1100	1300
Price, (See note),	\$185.00	230.00	268.00	320.00	384.00	442.00
No. of Sections,	4	5	6	7	8	9
Size of Grate, inches,	20×18	20×24	20×30	20×36	20×42	20×48
Width of Base at foundation line, inches, . .	28½	28½	28½	28½	28½	28½
Depth of Base at foundation line, inches, . .	25	31	37	43	49	55
Height of Heater to top of outlet, inches, . .	63	63	63	63	63	63
Height to top of Steam Trimmings, inches, .	74	74	74	74	74	74
Width of Heater at widest point, inches, . .	39	39	39	39	39	39
Width including Steam Trimmings, inches, .	46	46	46	46	46	46
Depth of Heater, including smoke-hood and shaker attachment, inches,	44	50	56	62	68	74
Height of Water Line, inches,	52	52	52	52	52	52
Diameter of Smoke Pipe, inches,	8	9	10	11	12	12
Tappings for Flow Pipe, (Returns duplicate),	2—3"	2—3"	2—3"	2—4"	2—4"	2—4"
Height from floor to centre of return op'g, inches	17	17	17	17	17	17
Telegraph Code,	Idle	Ignite	Ignore	Illegal	Illude	Illumine

We furnish sufficient **Asbestos Cement** to provide an inch covering for the heater, also trimmings, consisting of Poker, Slice Bar, Flue Brush, Scraper and Steam Trimmings, (draft regulator, safety valve, steam gauge, gauge cocks, and water column).

Above ratings are based upon an indicated pressure of 2 lbs. at the boiler, and provide that, in estimating the size of boiler required, all piping (mains and risers, flow and return) shall be figured as radiating surface, in addition to the cast-iron direct radiation to be used.

When a pipe, coil or cast-iron section is introduced into the fire-pot, or a steam coil placed in a tank, for the purpose of heating water for domestic use, additional capacity should be provided in estimating size of boiler required, at the rate of 1¼ sq. ft. of direct radiation for each gallon of water to be thus heated per hour.

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Imperial Sunshine Heater.

WATER.

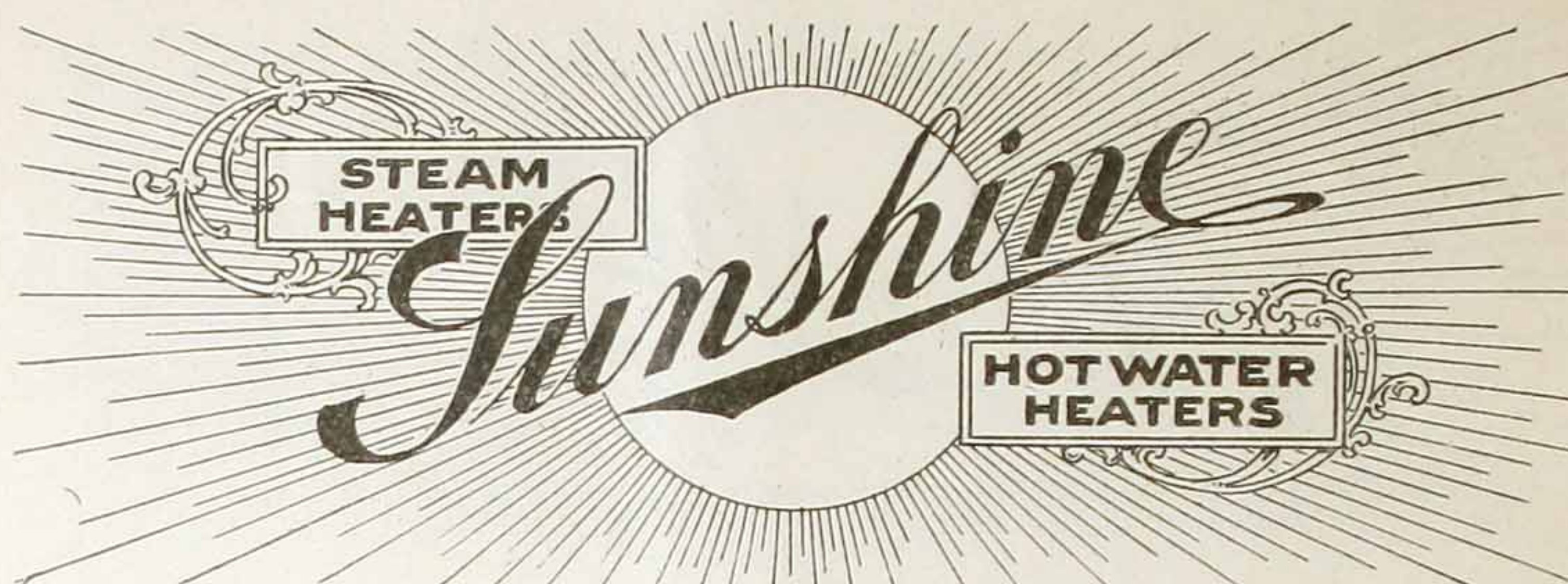
No. of Heater,	204	205	206	207	208	209
Rating, sq. ft.,	650	900	1150	1450	1750	2100
Price, (See note),	\$172.00	211.00	253.00	300.00	350.00	415.00
No. of Sections,	4	5	6	7	8	9
Size of Grate, inches,	20×18	20×24	20×30	20×36	20×42	20×48
Width of Base at foundation line, inches, . .	28½	28½	28½	28½	28½	28½
Depth of Base at foundation line, inches, . .	25	31	37	43	49	55
Height of Heater to top of outlet, inches, . .	63	63	63	63	63	63
Width of Heater at widest point, inches, . .	39	39	39	39	39	39
Depth of Heater, including smoke-hood and shaker attachment, inches,	44	50	56	62	68	74
Diameter of Smoke Pipe, inches,	8	9	10	11	12	12
Tappings for Flow Pipe, (Returns duplicate)	2—3"	2—3"	2—3"	2—4"	2—4"	2—4"
Height from floor to centre of return o'pg, inches	17	17	17	17	17	17
Telegraph Code,	Image	Imitate	Immerse	Impact	Impeach	Impede

We furnish sufficient **Asbestos Cement** to provide an inch covering for the heater, also trimmings consisting of Poker, Slice Bar, Flue Brush and Scraper.

Above ratings are based on a standard of water at a temperature of 180° Fahrenheit as it leaves the boiler, and provide that in estimating the size of boiler required, all piping (mains and risers, flow and return) shall be figured as radiating surface, in addition to the cast-iron direct radiation to be used.

When a pipe, coil or cast-iron section is introduced into the fire-pot for the purpose of heating water for domestic use, additional capacity should be provided in determining the size of boiler required, at the rate of two square feet of direct radiation for each gallon of water to be thus heated per hour.

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Vestal Sunshine Heater.

FULL-REVERTIBLE FLUE PATTERN.

STEAM.

No. of Heater,	115	117	119	121	123
Rating, sq. ft.,	200	250	300	375	450
Price, (See note)	\$98.00	114.50	131.00	155.50	200.00
Diameter of Grate, inches,	15	17	19	21	23
Diameter of Base at foundation line, inches,	25	27	30	32	34
Distance, front to back, from foundation line to outside of smoke-hood, inches,	30½	32	36	38	40
Height of Heater to top of outlet, inches,	53	54	55	56	59
Height to top of Steam Trimmings, inches,	66	67	68	69	72
Height of Water Line, inches,	47	48	49	50	51
Diameter of Smoke Pipe, inches,	8	8	8	8	8
Height from floor to centre of return op'g, inches,	14	14½	15¼	16½	17
Tappings for Flow Pipe, (Returns duplicate),	1—2"	1—2½"	1—2½"	1—3"	1—3"
Telegraph Code,	Velum	Veratrum	Verbatim	Velarium	Variform

HALF-REVERTIBLE FLUE PATTERN.

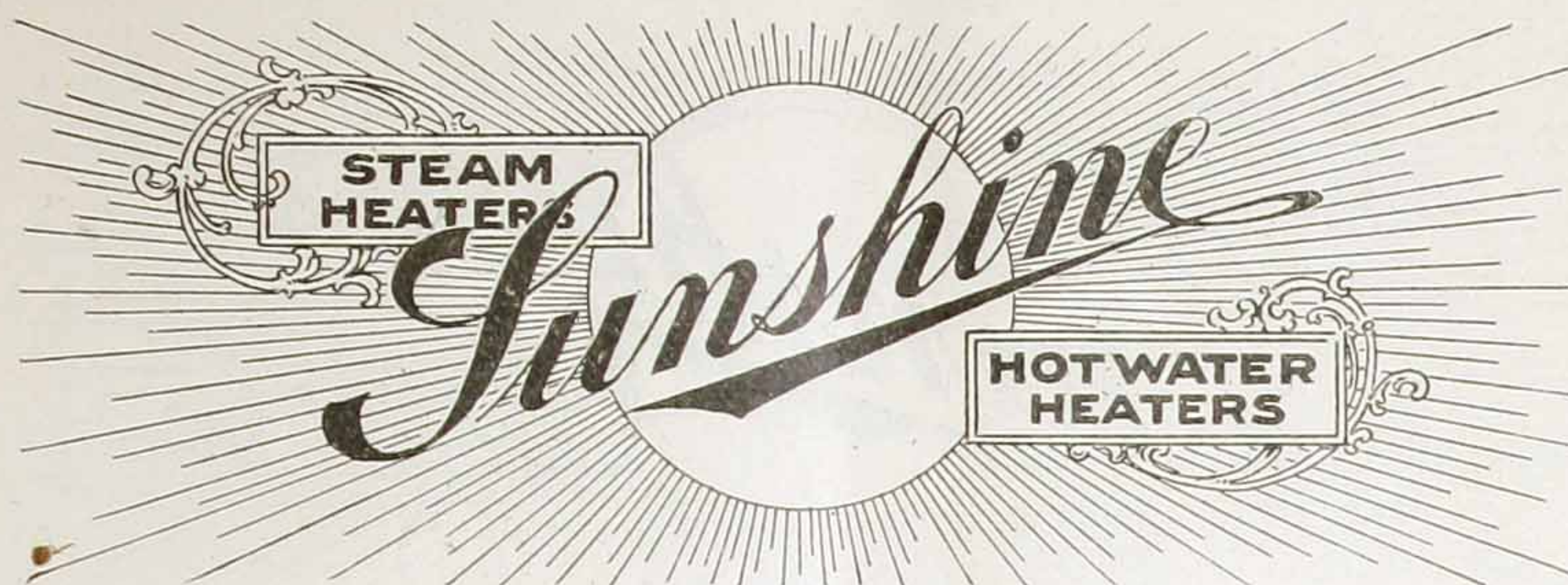
No. of Heater,	15	17	19	21	23
Rating, sq. ft.,	175	225	275	325	400
Price, (See note),	\$91.00	106.50	123.00	139.00	164.00
Diameter of Grate, inches,	15	17	19	21	23
Diameter of Base at foundation line, inches,	25	27	30	32	34
Distance, front to back, from foundation line to outside of smoke-hood, inches,	30½	32	36	38	40
Height of Heater to top of outlet, inches,	53	54	55	56	59
Height of top of Steam Trimmings, inches,	66	67	68	69	72
Height of Water Line, inches,	47	48	49	50	51
Diameter of Smoke Pipe, inches,	8	8	8	8	8
Height from floor to centre of return op'g, inches,	14	14½	15½	16½	17
Tappings for Flow Pipe, (Returns duplicate)	1—2"	1—2½"	1—2½"	1—3"	1—3"
Telegraph Code,	Vacuum	Vadium	Venom	Victim	Vasum

We furnish trimmings consisting of Slice Bar, Flue Brush, and Steam trimmings (draft regulator, safety valve, steam gauge and water column).

Above ratings are based upon an indicated pressure of 2 lbs. at the boiler, and provide that, in estimating the size of boiler required, all piping (mains and risers, flow and return) shall be figured as radiating surface, in addition to the cast-iron direct radiation to be used.

When a pipe, coil or cast-iron section is introduced into the fire pot, or a steam coil placed in a tank, for the purpose of heating water for domestic use, additional capacity should be provided in estimating size of boiler required, at the rate of 1¼ sq. ft. of direct radiation for each gallon of water to be thus heated per hour.

Guarantee: Our boilers are guaranteed to the extent of furnishing new castings for any found to be defective in manufacture. The foregoing ratings are conservatively made in accordance with accepted standards, but on account of the varying conditions surrounding the installation of a boiler we make no guarantee except as above.



Vestal Sunshine Heater.
FULL-REVERTIBLE FLUE PATTERN.

WATER.

No. of Heater,	115	117	119	121	123
Rating, sq. ft.	325	400	500	600	750
Price, (See note)	\$88.50	103.00	123.00	142.50	185.50
Diameter of Grate, inches,	15	17	19	21	23
Diameter of Base at foundation line, inches,	25	27	30	32	34
Distance, front to back, from foundation line to outside of smoke-hood, inches,	30½	32	36	38	40
Height of Heater to top of outlet, inches,	49	51	52	53	54
Diameter of Smoke Pipe, inches,	8	8	8	8	8
Height from floor to centre of return op'g, inches,	14	14½	15¼	16½	17
Tapping for Flow Pipe, (Returns Duplicate)	1—2"	1—2½"	1—2½"	1—3"	1—3"
Telegraph Code,	Valor	Vagrant	Vaunt	Veil	Verbal

HALF-REVERTIBLE FLUE PATTERN.

No. of Heater,	15	17	19	21	23
Rating, sq. ft.	275	375	450	525	650
Price, (See note)	\$78.50	98.00	113.00	127.50	152.00
Diameter of Grate, inches,	15	17	19	21	23
Diameter of Base at foundation line, inches,	25	27	30	32	34
Distance, front to back, from foundation line to outside of smoke-hood, inches,	30½	32	36	38	40
Height of Heater to top of outlet, inches,	49	51	52	53	54
Diameter of Smoke Pipe, inches,	8	8	8	8	8
Height from floor to centre of return op'g, inches,	14	14½	15¼	16½	17
Tapping for Flow Pipe, (Returns duplicate)	1—2"	1—2½"	1—2½"	1—3"	1—3"
Telegraph Code,	Vacant	Vague	Vain	Valid	Valley

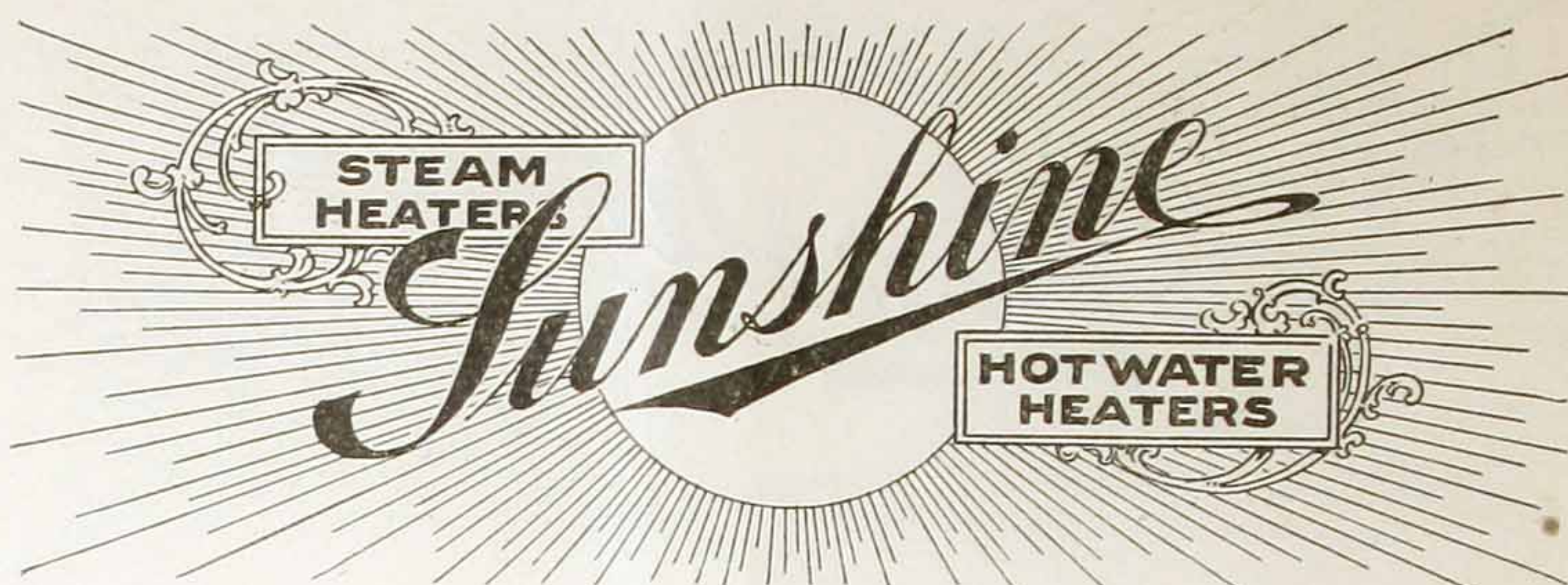
We furnish trimmings consisting of Slice Bar and Flue Brush.

We tap all water heaters for Altitude Gauge and Thermometer.

Above ratings are based on a standard of water at a temperature of 180° Fahrenheit as it leaves the boiler, and provide that in estimating the size of boiler required, all piping (mains and risers, flow and return) shall be figured as radiating surface, in addition to the cast-iron direct radiation to be used.

When a pipe, coil or cast-iron section is introduced into the fire-pot for the purpose of heating water for domestic use, additional capacity should be provided in determining the size of boiler required, at the rate of two square feet of direct radiation for each gallon of water to be thus heated per hour.

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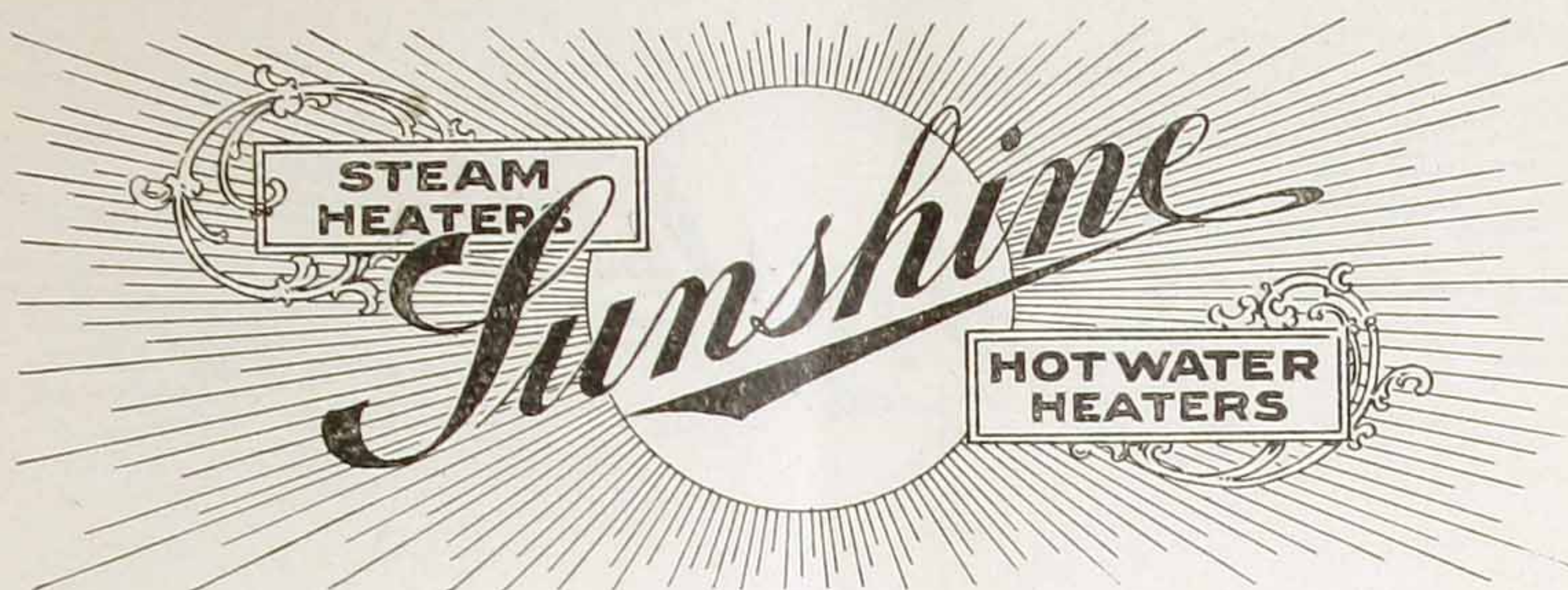


Shipping.

All heaters are mounted and inspected before dismantling and packing for shipment. Breakable parts are crated, and small parts are packed in barrels. We will furnish new parts for any found defective in manufacture, but we will not be responsible for any damage to goods in transit or from careless handling, and in no case will bills for work on repairs be allowed.

Approximate Shipping Weights.

No.	Steam lbs.	Water lbs.	No.	Steam lbs.	Water lbs.
15	650	550	254	2500	2300
17	750	650	255	2800	2600
19	900	800	256	3100	2900
21	1050	950	257	3400	3200
23	1200	1100	258	3700	3500
115	700	600	259	4000	3800
117	800	700	416	4500	4200
119	950	850	417	5000	4700
121	1100	1000	418	5500	5200
123	1250	1150	419	6000	5700
			4110	6500	6200
No.	Steam lbs.	Water lbs.	No.	Steam lbs.	Water lbs.
204	2300	2200	207	3500	3400
205	2700	2600	208	3800	3700
206	3100	3000	209	4200	4100



Useful Information.

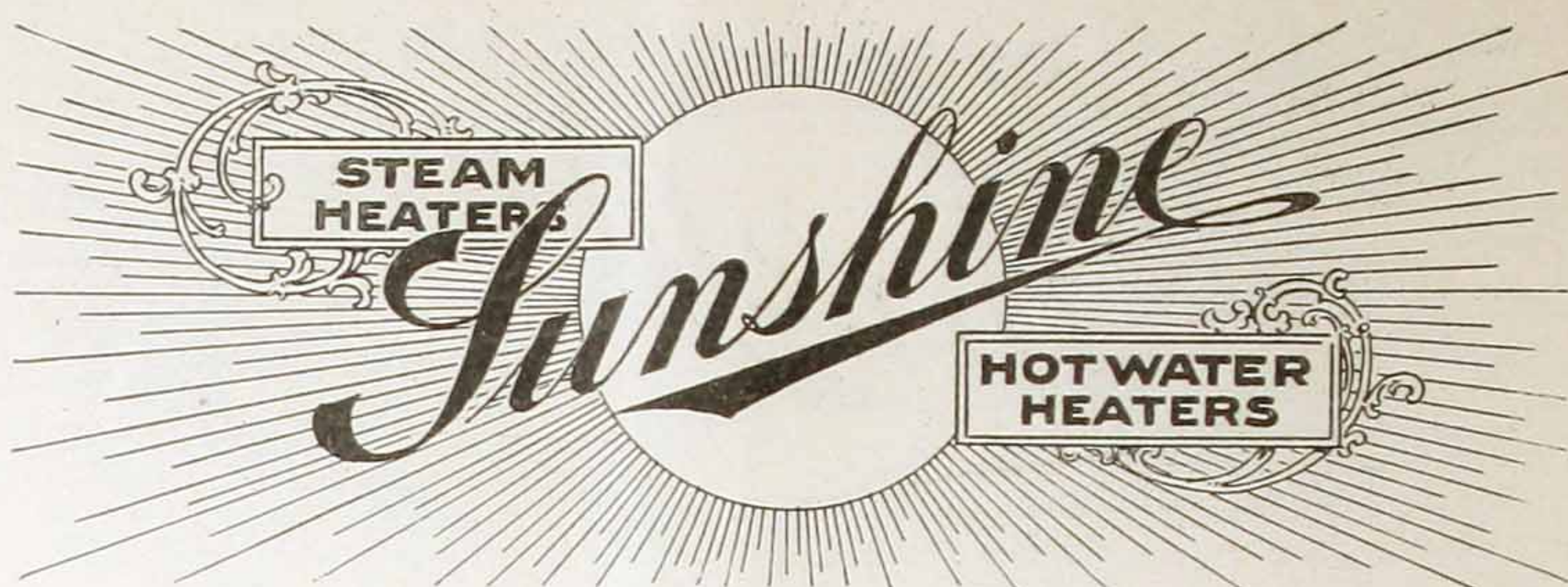
Area of Circles.				Temperature of Steam.			
Diam.	Area	Diam.	Area	Pressure per sq. in.	Temperature degrees Fahrenheit	Pressure per sq. in.	Temperature degrees Fahrenheit
1	.785	7	38.484				
2	3.141	8	50.265	0	212	5	228
3	7.068	9	63.617	1	216	10	240
4	12.566	10	78.54	2	219	15	250
5	19.635	11	95.033	3	222	25	267
6	28.274	12	113.097	4	225	50	298

Expansion of Wrought Iron Pipe.

Temperature of the Air when fitted	Length of Pipe when fitted ft.	Length of Pipe when heated to							
		215°		265°		297°		338°	
		ft.	in.	ft.	in.	ft.	in.	ft.	in.
Zero	100	100	1.72	100	2.12	100	2.31	100	2.70
32°	100	100	1.47	100	1.78	100	2.12	100	2.45
64°	100	100	1.21	100	1.61	100	1.87	100	2.19

Pressure of Water for each Foot in Height.

Ft. Height	Pounds per sq. in.	Ft. Height	Pounds per sq. in.	Ft. Height	Pounds per sq. in.
1	.43	15	6.49	50	21.65
2	.86	20	8.66	70	30.32
5	2.16	25	10.82	80	34.65
10	4.33	40	17.32	100	43.31



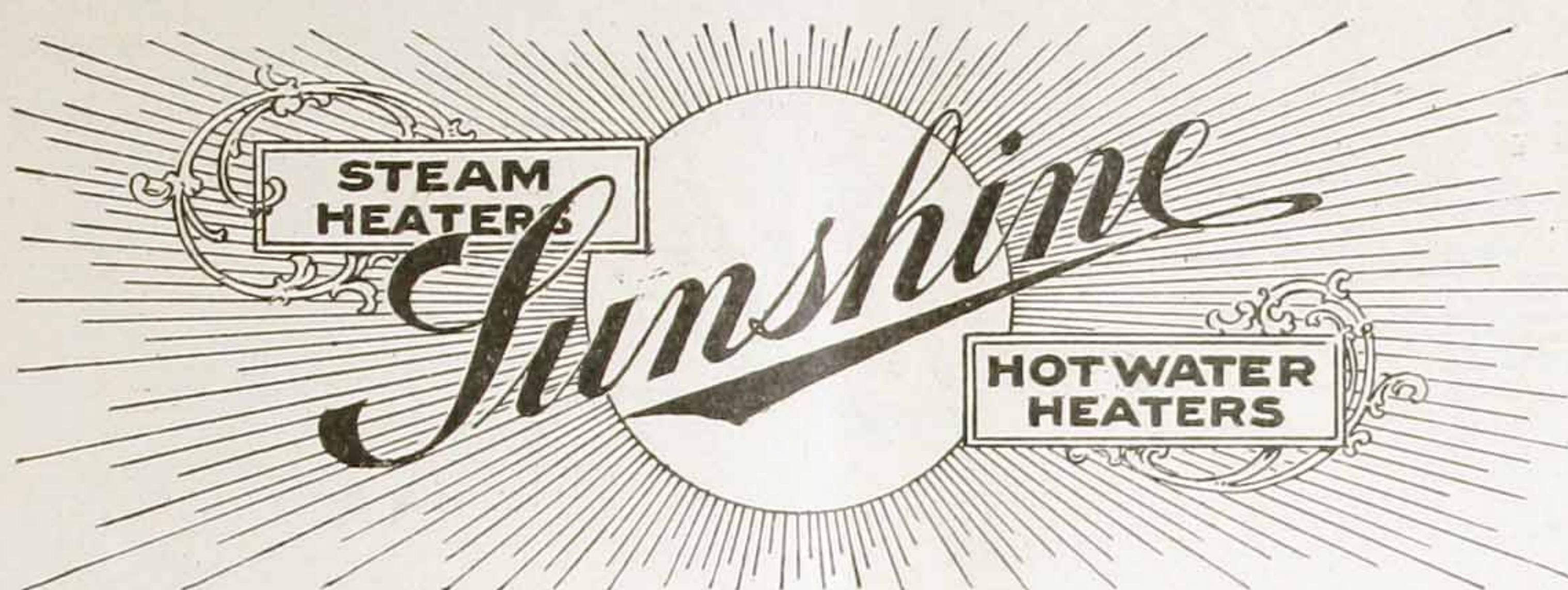
Gallons of Water and sq. ft. of Radiating Surface contained in one foot of different sizes of Wrought-iron Pipe.

Size of Pipe	Gallons of Cold Water	Sq. ft. of Radiation	Size of Pipe	Gallons of Cold Water	Sq. ft. of Radiation
$\frac{1}{2}$	.01	.22	$2\frac{1}{2}$	.25	.75
$\frac{3}{4}$	.02	.27	3	.37	.92
1	.04	.35	$3\frac{1}{2}$	.50	1.05
$1\frac{1}{4}$	.06	.43	4	.65	1.17
$1\frac{1}{2}$	.09	.50	5	1.02	1.45
2	.16	.62	6	1.55	1.74

Approximate ratios for estimating Radiation.

	One square foot of Radiating Surface will heat	
	Steam	Water
Bath rooms and living rooms with two or three exposures,	40 cubic feet	25 cubic feet
Living rooms, one exposure,	50 " "	30 " "
Sleeping rooms and halls,	60 " "	35 " "
School rooms, offices, stores,	65 " "	40 " "
Churches and auditoriums,	90 " "	55 " "

Above ratios are for direct radiation. If indirect radiators are used add 50% more surface—for direct-indirect 25% more. In estimating make due allowance for location and exposure of building, material of construction, length and size of mains, location and capacity of boiler loose construction of doors and windows, and capacity of chimney.



Approximate Size of Chimney.

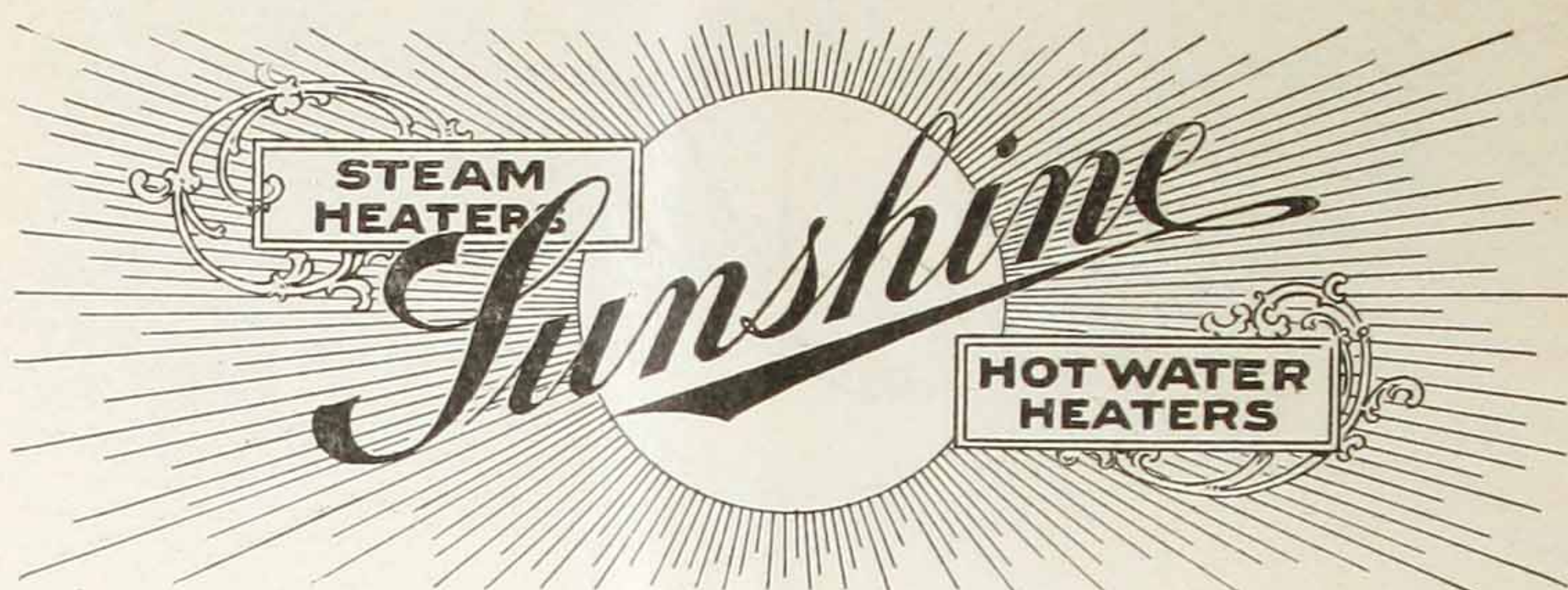
Cu. ft. in Building	Inside Dimensions of Chimney	Cu. ft. in Building	Inside Dimensions of Chimney
Under 15000	8 x 8	30000 to 50000	12 x 12
15000 to 30000	8 x 12	50000 to 100000	12 x 16

Sizes of Expansion Tanks.

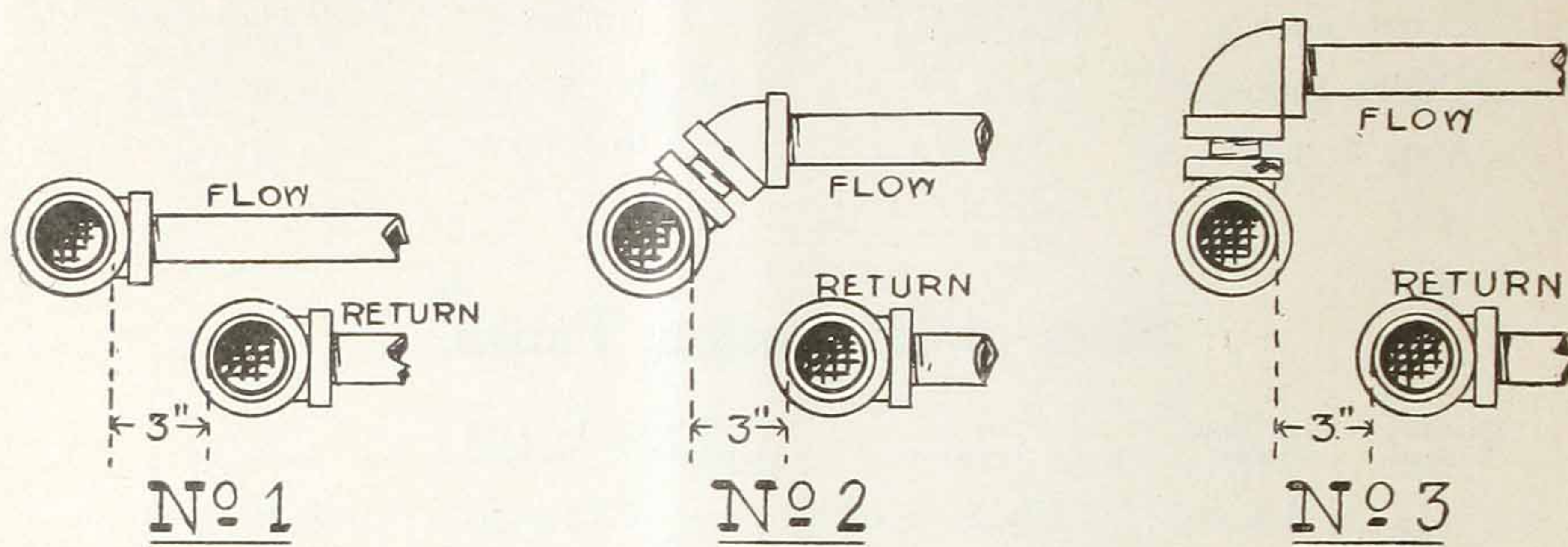
Capacity Gallons	Size Tank Inches	Sq. ft. Radiation	Capacity Gallons	Size Tank Inches	Sq. ft. Radiation
5 1/2	9 x 20	Under 200	20	14 x 30	500 to 700
8	10 x 20	200 to 250	26	16 x 30	700 to 1000
10	12 x 20	250 to 300	32	16 x 36	1000 to 1400
12	12 x 24	300 to 400	42	16 x 48	1400 to 2000
15	12 x 30	400 to 500	66	18 x 60	2000 to 3500

Size of Mains and Risers.

Size of Pipe	One pipe, Steam	Two pipe Steam, or Water
1	45 feet radiation and under	50 feet radiation and under
1 1/4	45 to 90 feet radiation	50 to 100 feet radiation
1 1/2	90 to 180 " "	100 to 200 " "
2	180 to 360 " "	200 to 400 " "
2 1/2	360 to 540 " "	400 to 600 " "
3	540 to 720 " "	600 to 800 " "
4	720 to 1440 " "	800 to 1600 " "
5	1440 to 2880 " "	1600 to 3200 " "
6	2880 to 5760 " "	3200 to 6400 " "



This illustrates the manner of making branch connections with horizontal mains.



Radiators should be tapped as follows:

For Steam.

				Two pipe	One pipe
Less than 30 square feet				$\frac{3}{4}$ x $\frac{3}{4}$ inch	1 inch
From 30 to 50	"	"		1 x $\frac{3}{4}$ "	$1\frac{1}{4}$ "
" 50 to 100	"	"		$1\frac{1}{4}$ x 1 "	$1\frac{1}{2}$ "
" 100 to 160	"	"		$1\frac{1}{2}$ x $1\frac{1}{4}$ "	2 "

For Water.

Less than 20 square feet				$\frac{3}{4}$ x $\frac{3}{4}$ inch
From 20 to 50	"	"		1 x 1 "
" 50 to 100	"	"		$1\frac{1}{4}$ x $1\frac{1}{4}$ "
100 and over	"	"		$1\frac{1}{2}$ x $1\frac{1}{2}$ "

Indirect radiators require a size larger pipe than direct radiators.

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